The IRON AGE
May 21, 1959 A Chilton Publication The National Metalworking Weekly

Philco's H. F. Argento—

Industry Shifts With Changing Defense Concepts P. 101

Which Mills Won't Be Hit By a Steel Strike? – P. 106

How to Lower Maintenance Costs – P. 139

Digest of the Week – P. 2-3

ARISTOLOY

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The IRON AGE

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Management's Move—McDonald scores a beat on management with

his "social visit" with Eisenhower. Steel bargaining is most unusual in years. P. 104

IF THERE'S A STRIKE

All Mills Won't Close—Steel labor can't or won't strike some mills. But the list has been shortened. Kaiser Steel now has a contract that expires the same time as other big mills. P. 106

SMOKE CONTROL

It Poses Problems for Mills—Pittsburgh's smoke control law is up for revision June 1. It could mean stricter rules for control of open-hearth smoke. Mills would have to invest in more equipment. P. 109

MACHINE TOOLS

Productivity Counts—Tool engineers are advised not to get too tangled up in the details. It's not always the same type of machine

Metalworking

MODERN DEFENSE: Men like Philco's H. F. Argento are charged with responsibility of meeting explosive demands of defense business. How Philco and others meet the challenge is reported in this week's Special Report. (Philco photo) P. 101

that should be bought to replace a worn out unit. P. 125

RACE CAR DESIGN

Some New Wrinkles—Entries in the annual Memorial Day race at Indianapolis feature new designs. One car has air-jack system to speed pit stops, another has engine turning counter-clockwise. P. 123

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PLANT MAINTENANCE

Cost-Cutting Ways — Even small improvements in planning, scheduling and executing can bring big savings. First step is to know what your present program involves and what it costs. Maintenance planning starts with good equipment and then includes everything from minor repairs to major overhauls. P. 139

METAL-LIKE PLASTIC

Resists Impact — Aimed at improving product design at less cost, a new rigid thermoplastic has strength properties approaching those of nonferrous metals. Field tests have covered a wide range of products from automotive instrument housings to gears, bushings and bearings. P. 142

PRICE-LEVEL DEPRECIATION

Why It's Logical—From a professional accounting, there are several reasons for the price-level approach to depreciation reform. To be realistic, dollars must be related to purchasing power. P. 144

CARBURIZING QUALITY

With New Furnace—Good carburizing quality requires a careful balance of basic factors. Improved furnace design helps control of product quality. P. 148

CARBIDE DEPOSIT

For Longer Tool Life—A simple methods adds a layer of tungsten carbide to critical tool areas. In a controlled trial under laboratory conditions, the surfacing doubled the life of a HSS tool. P. 152

MARKETS & PRICES

U. S. SURPLUS SALES

Irk Used Tool Dealers—Government methods of selling excess machine tools are irritating used machinery dealers. Their national association wants to check on disposal procedures. P. 105

PLASTICS IN AUTOS

New Push Started—"Delrin," a new acetal resin, is being promoted to the hilt in Detroit by Du Pont. It's a potential rival for steel and nonferrous diecastings. P. 117

MILITARY BUYING

Changes Needed—A centralized procurement agency for Army, Navy and Air Force is the answer to wasteful buying. But will Ike and Congress force the services to mend their ways? P. 121

NEW STEEL ORDER WAVE

Pickup in 3rd Quarter Demand —Because of the uncertain steel labor outlook, some users were hesitating to order for 3rd quarter. Now many are hurrying to get on mill books. P. 185

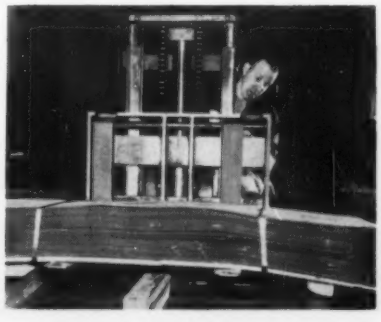
ELECTRICAL CONTROLS

Sales Head Up—Market for electrical controls in April was improved 10-15 pct over April '58. And prospects are good for further gains this month. P. 186

NEXT WEEK

MATERIALS HANDLING

In Step With Production—Every plant, large and small, needs the materials handling setup best suited to keep its production lines in step with each other. Next week's Materials Handling Show feature covers many handling situations.

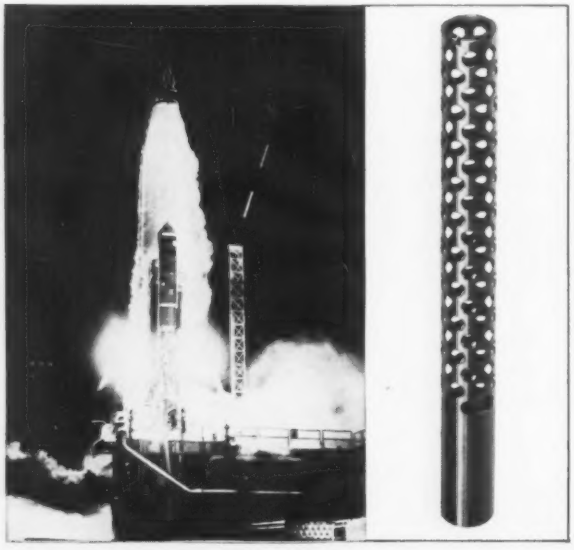


BISHOP Tubular Products NEWS

"METALS FOR PRECISION AND PERFORMANCE"

BISHOP QUICK SERVICE TEAM SOLVES STICKLER IN ATLAS PROGRAM

Telemetering bulb part (illustrated)—originally of 304 seamless tubing—cracked during fabrication. BISHOP specialists were called in—304L seamless, ½ hard was recommended and supplied (against a tough deadline). *Results:* The 304L part met all requirements, including critical resistance to vibration fatigue within a temperature range of -80° to -380°F in inert helium, and gave completely satisfactory performance in the Atlas program. More information on 304L—or any BISHOP tubular products? Use the coupon.



BIMETALLICS NOW AVAILABLE IN MANY DIFFERENT FORMS, METALS

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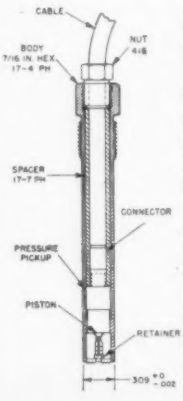

17-7 PH* TUBING BEING DRAWN TO HYPODERMIC SIZE

Small diameter 17-7 PH tubing, welded and seamless, is available from BISHOP now on standard order in sizes down to .375 in. OD X .035 in. wall—on special order to .020 in. OD X .006 in. wall. Accompanying illustration shows a piezoelectric transducer used for measuring pressures up to 100,000 psi in ballistics and hypersonic research work. Use of welded 17-7 PH spacer in transducer permitted finish machining of the part *before* heat treating. Want more data on BISHOP's 17-7 PH products or other super alloys? Use the coupon.

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WHY ARMCO 17-7 PH STAINLESS HELPS ASSURE PRECISION PERFORMANCE AND LOW COST FOR ELECTRIC SWITCHES

A leading manufacturer of subminiature, small industrial and commercial, and precision electric switches recently specified Armco 17-7 PH Stainless Steel for the center blades and patented rolling springs in many of their products. A non-ferrous spring material was replaced with 17-7 PH Stainless because its unusual characteristics offered the opportunity to improve the reliability and performance of their switches at low cost. The mechanical life of one part was increased from 30,000 to 30,000,000 cycles!

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Good corrosion resistance, much superior to that of the hardenable chromium grades of stainless steels.

Where even greater strength is needed, Armco 17-7 PH hard temper (Condition C) sheet and strip can be heat treated to a typical ultimate tensile strength of 265,000 psi. And, if parts require extensive fabrication, they can be easily formed from annealed 17-7 PH then hardened to high strength and hardness.

Improve the reliability and performance of your products by using 17-7 PH Stainless Steel for parts that require high strength and hardness up to 900 F, good corrosion resistance, and excellent fabricating characteristics. Armco 17-7 PH is available in sheets, strip, plates, bars, and wire; a companion grade, Armco 17-4 PH in bars, wire, and billets.

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Same Summit Story It Never Changes Much

Hope springs eternal, they say. But that saying was adopted long before we had the Reds to contend with.

The hope part is really on their side. Khrushchev & Co. are always hoping we will be suckers. As a rule we are: Not because we want to be but because we think we have to "do something" to show we want peace.

It seems unnecessary at this late date to bring up the question of the Communists' motives. But there are still millions of people in this nation who "wish" to take the Reds at their face value.

And we have the sad situation of some British statesmen acting as if the "friendly" Russian dictator and his henchmen will do and say the "right" thing. That just isn't true.

Mr. Khrushchev has always wanted a Summit meeting with President Eisenhower in order to enhance his own position. Such meetings are also desired to show that the satellite status quo is "recognized" by the Western world.

By overstretching our imagination, suppose a Summit meeting does produce a mouse. If it ever does, it will be at the expense of the Western world. The Reds hold all the cards. They so distort the truth and control their countries that they make a piker out of a chameleon.

Mr. Eisenhower knows well what fateful pitfalls Summit meetings have in store for us. He also knows that it is pretty useless to hold the talks. But pressure from our allies is so great that they will probably be held again with the same results as in the past—no gain for the West and much propaganda for the Reds.

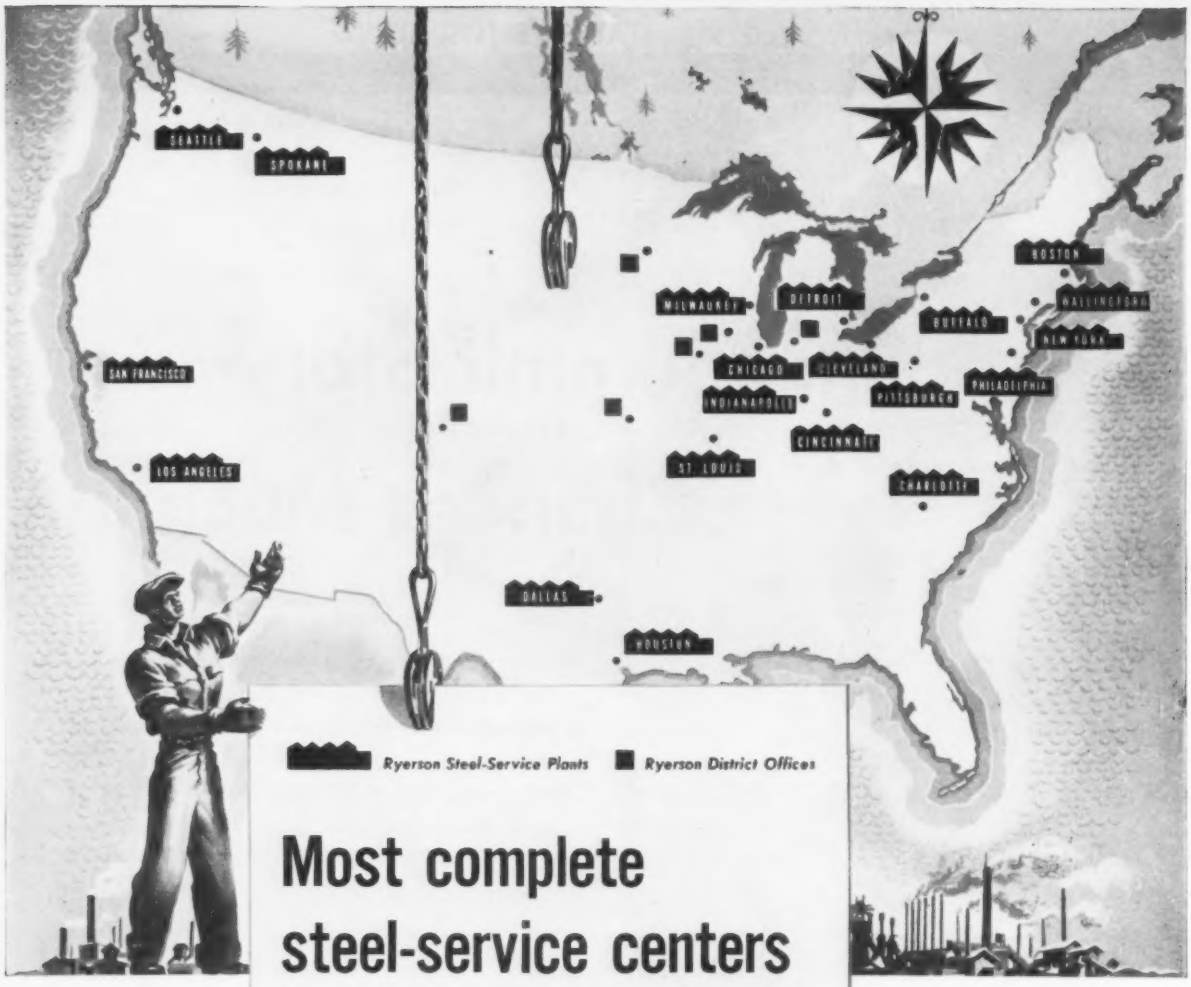
The only thing which could stop the Summit meeting would be another secret blast at Mr. Khrushchev from Red China. But that may not come this time, with China having its own troubles trying to eradicate the Tibetans—a most impossible task even for the Red Chinese.

To suggest that another Summit meeting—if it comes—will produce anything of real merit is to be less than realistic—or honest. It hasn't in the past. And even if it should, the magnitude of the "advance" could hardly be balanced against the pitfalls the Western alliance is likely to fall into.

There is no reason why there should be a Summit meeting just because Khrushchev wants it. And we are being a patsy each time we fall into his trap.

Tom Campbell

Editor-in-Chief



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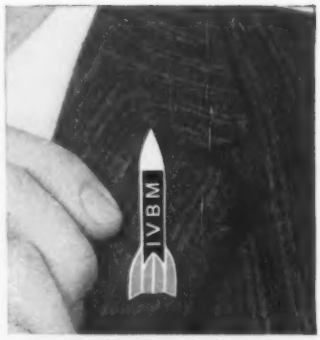

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Continuous Vacuum Furnace

Designed to handle strip on a continuous basis, a new vacuum heat-treating furnace can be fuel fired or electrically heated. To maintain low internal pressures, the strip must be clean prior to entering the equipment. Pressures can be kept down to 1 micron and below. Materials enter and leave the unit through mercury seals. The laboratory prototype is being rebuilt to accommodate strip up to 4 in. wide and up to 0.030 in. thickness.

Spin Weld for Plastics

Basic plastics research has come up with an old technique for fast, economical assembly of small plastics parts: spin welding. It uses frictional heat to result in a permanent bond at 90 pct of tensile strength of original material.

Yields Higher Quality Steel

Ferroalloy producers report a trend to increasing use of alloy additives by steel mills. Not only is demand for alloy and stainless grades rising, but mills are being fussier about elements in carbon grades. Tendency is to crowd upper limits of specifications for manganese, silicon and the like to yield higher quality steel without actually changing analysis.

Railroads Push for Reforms

The threat of a railroad strike is not easing. Statements last week indicate the railroads are sticking to their stand against featherbedding practices. Federal mediation would delay the stoppage beyond the Nov. 1 contract expiration, but railroad men say they will push for reforms even if it means going to a strike.

To Cut Power-Weight Ratio

A new ferrite material will open up the range of frequencies for power applications. The product, when used with other recently developed solid-state devices, will mean increased efficiency in electronic and electrical equipment. It makes possible use of frequencies from 400 to 25,000 cps with a resultant savings in size and weight. For example, when a 1000-cps motor replaces a 60-cps unit, weight savings will be over half.

Overseas Technical Pool

If you're looking for overseas technical personnel to strengthen your engineering or research departments, Holland may be the answer. Recruiters, specializing in scientific and engineering talent, report the Dutch market one of the best. And salaries run not much more than $400 per month for a trained man with field experience.

World-Wide Space Control

This country should go ahead without the Soviets to establish world-wide controls over peaceful exploration of outer space, congressmen say. If we don't, present "anarchy in space" will grow. Backers of international space control want agreements on launching notices, identification and radio frequencies.

Meet Foreign Competition

A national meeting of production engineers and executives heard last week that automation and revision of depreciation rules are vital to halting loss of American metalworking markets. Industry must accelerate use of automation to overcome labor costs that are four to six times that of foreign rates. Capitol recovery in U. S. takes 12-30 years under present policies, but only 4-8 years in most Western European countries.

Improve Space Patent Law

Congress is considering changes in current law to aid space-program contractors. Present patent section in the act creating the National Aeronautics and Space Administration disturbs many contractors. It can be interpreted to give NASA title to almost any patentable item developed under NASA contract. NASA has worked out a waver system to this section, but the agency and contractors would prefer a permanent change.

8 belts do a 10-belt job— 6 times as long

SMASHING chunks of nickel formate into small, dust-like particles is rugged business. What with the short-centered, dusty, 5,868 f.p.m. drives on their busy micro-atomizer, this Midwestern chemical plant was replacing whole sets of V-belts every 3 to 4 weeks.

Obviously, this heavy, month-after-month expense had to stop. Hopefully, they turned to the G.T.M.—Goodyear Technical Man. Confidently, he recommended COMPASS-V-Steel Belts with the Green Seal – built around airplane-type steel cable.

Thanks to this built-in strength, 8 of these super belts were able to handle what had always been a 10-belt job. And thanks to their unmatched toughness and dimensional stability, the G.T.M.'s belts had served a full 6 months at last report – looked good for at least 6 more.

And that's a typical experience. In countless belting jobs, COMPASS-V-Steel Belts with the Green Seal are giving longer service with fewer belts using smaller, less costly pulleys. Get the full moneysaving story from your Goodyear Distributor—or by writing Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

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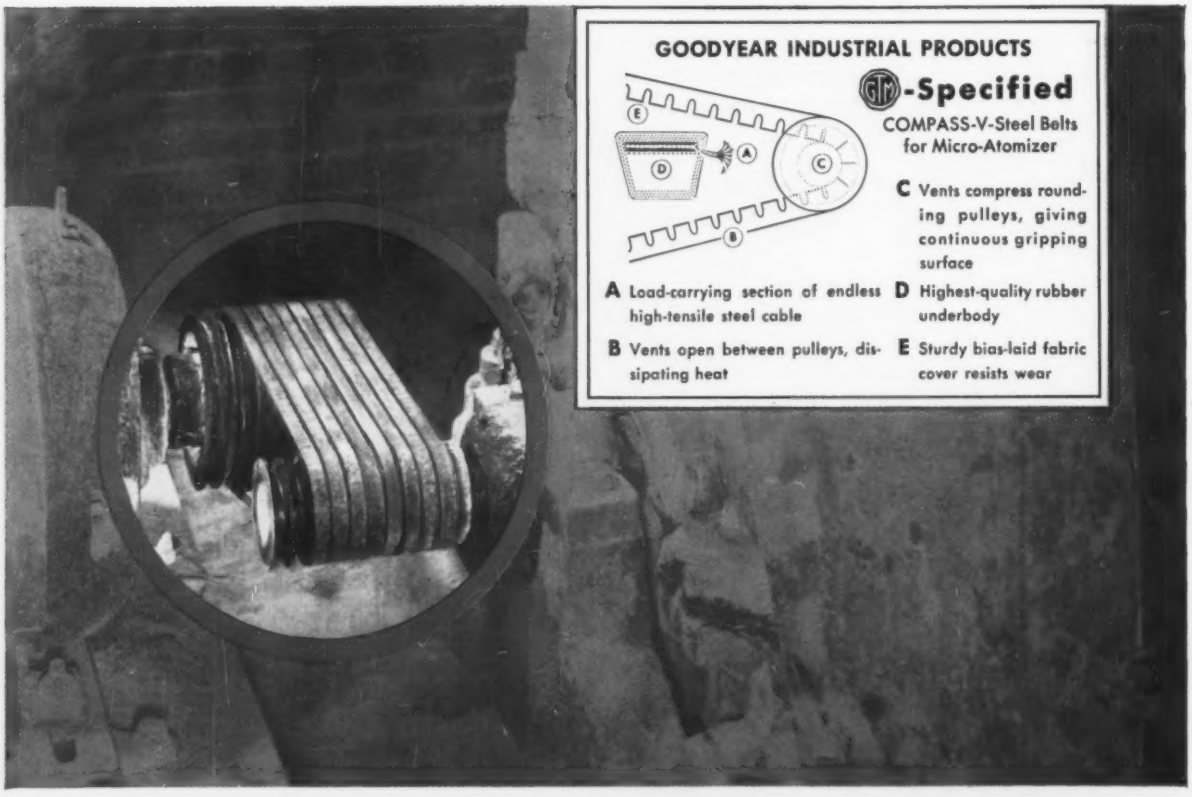

V-BELTS WITH THE GREEN SEAL by

GOODYEAR

Green Seal, Compass—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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Defense Series

Recent changes in defense technology have been referred to as "explosive." If anything, that's a conservative word.

No one knows it better than the metalworking companies who have been defense contractors in the past. Old concepts are gone; new concepts are evolved with each technological breakthrough.

This week we're starting a new series exploring the problems of doing defense business. It isn't exactly a "how to do it" series, but we really believe it can help you in your decisions whether or not, and how, to go after defense contracts.

The first installment (p. 101) takes up the management problems. It's based mostly on interviews with industrial leaders who head defense divisions in major companies. Other articles will cover the problems of manufacturing for aircraft and missiles and how new theories of defense have affected metals use.

Cards for China

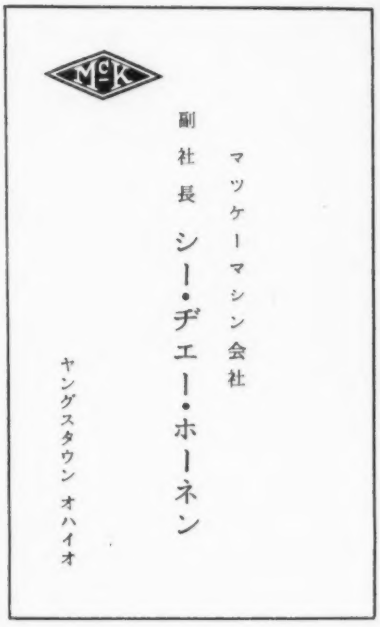
It seems there's a traveling salesman—

Well actually there is a traveling salesman. His name is C. J. Honen. And he's vice president in charge of sales promotion for the McKay Machine Co., Youngstown, Ohio.

In the course of his traveling Mr. Honen was bound for China. So naturally he had some calling cards made up in Chinese.

He handed them out in the usual position and was surprised to see everyone turn them around vertically.

Reflecting that East is East and West is West he then re-ordered a second batch of cards. (See photo.) The little trademark to the upper

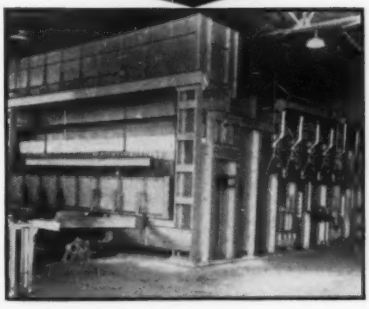


left hand corner serves as a marker. It indicates where to place the thumb to hand the card out correctly.

Guess you might say the first batch of cards were "occidentally" incorrect.

"No sir! Helen isn't one of those wives who meets you with hand outstretched on pay day."

FIRST CHOICE FOR PIPE ANNEALING



R-S CAST IRON PIPE ANNEALING FURNACES USED BY EVERY LEADING PIPE FOUNDRY

For more than 35 years leading producers of centrifugal cast iron pipe have relied on chain conveyor type annealing furnaces designed and built by R-S.

R-S experience goes back to the first centrifugal cast iron pipe produced in this country more than 35 years ago. Since then cast iron pipe annealing furnaces have been a specialty with R-S engineers. Their experience and development of furnaces to meet the needs of annealing cast iron pipe has kept pace with the industry. Today, R-S pipe annealing furnaces offer greater uniformity of heating through all ranges and precision controlled cooling.

R-S pipe annealing furnaces range in capacities from 15 to 35 tons per hour. Write for complete information on the newest developments in centrifugal cast iron pipe annealing by R-S.

R-S FURNACE COMPANY, INC.
NORTH WALES, PA.

R-S FURNACES

Reducing Billets to Wire Rods in Continental's Continuous Rod Mill. From an original scratchboard drawing by James R. Neebe.

"Speedway" for Hot Rods

From billets to rods—three strands at a time travel through Continental's modern new Continuous Rod Mill. In the complete rolling process a 2½" round cornered square billet 30 feet long may be reduced to a .218 inch diameter round wire rod approximately 4,700 feet long. The glowing strands can be seen as they progress through 22 roll stands. At the final pass the rod is moving at a speed of about 5,000 feet per minute.

It's all a part of the important job of making wire for home, farm and industry . . . wire for more than a thousand applications. For from the shoes on your feet to the mechanical pencil in your pocket, from coat hangers to automobile control rods, wire plays an important part of our daily life.

Here at Continental's Rod Mill, steel rods are produced around the clock and sent to the wire mill for drawing, processing, and finishing into wire in a wide range of sizes and finishes. All Continental Wire is made from basic open hearth steel, in practically any size, temper, and analysis in low and medium low carbon steels. It will pay you to learn the whole story of Continental Wire—and how it can speed production and cut costs for you. Write for our new Manufacturers' Wire Manual today.

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PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, Kokote, Brytite, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright, and special shaped wire. Also Welded Wire Concrete Reinforcing Fabric, Continental Chain Link Fence and other products.

Fair Play

Sir — American Fair Play—What's Happening to It Indeed!

Why no mention in your editorial, May 7 issue, of the shabby treatment accorded Mrs. Luce by certain senators. She, too, has been a loyal and sincere American in government service. What was done to her was hardly competent and relevant.

If it had happened to Mr. Luce, would you have included him in your editorial?—Mary J. Doran, Frick Bldg., Pittsburgh.

▪ Yes—as we would attack the slander of any honorable businessman—Ed.

Tool Steels

Sir—Your article in the Apr. 30 issue—"How to Get More for Your Tool Steels Dollar" is very good and most informative. I feel that a lot of the information contained in this article would be very useful to our sales department in making recommendations on tool steels and offering alternates to requests that we get for various types.

I would appreciate it very much if you would send me twelve reprints.—J. V. Burley, Jr., Mgr., General Order Dept., Joseph T. Ryerson & Son, Inc., Cleveland.

Sir—We wish to compliment you on your thorough treatment of tool steels and their applications in the Apr. 30 issue.

Will you kindly furnish us with two reprints of this article.—W. A. Sawdy, MacInnes Steel Sales Co., Erie, Pa.

Service Centers

Sir—In reviewing the Apr. 23 issue of your magazine I was very interested in the article "Steel Warehouses Mechanize to Serve Customers Better."

This story was very complete and very enlightening. I would certainly appreciate it if you could forward me 15 to 25 copies of this article. —C. J. Jones, Mgr., Headquarters Sales, Wilbur B. Driver Co., Newark, N. J.

Correct Inventory

Sir—In your Apr. 16 issue on p. 152, the article "How Inventory Control Pays Off" has an error that should be corrected regarding purchasing at The American Stamping Company.

It states as follows: "American's inventory control systems cover about 150,000 tons of cut length, flat rolled steel a year—."

This should be corrected to read —"about 24,000 tons."—C. W. Custer, The American Stamping Co., Cleveland.

"We are going to improve our product radically . . . at least to the point that it will outlast the time payments."

W. C. "BILL" PINE, Hayes Chief Metallurgist, reports . . .

BRAZING CALLS FOR KNOW-HOW PLUS SHOW-HOW

Pioneer of controlled atmosphere heat treating, and developer of the *first* electric furnace for stainless steel brazing . . . Hayes today offers you one of the most extensive lines of furnaces and atmosphere generators for all types of metal bonding operations.

Hayes "KNOW-HOW" provides a customized brazing technique which takes into consideration every aspect of the job: Selection of alloys, placing and fixturing of work, choice of atmospheres, proper time-temperature cycles. Whatever the brazing application — from aluminum (900°F range) to platinum (3400°F range) — Hayes "SHOW-HOW" then proves the technique on full production-line equipment in our lab.

The Hayes answer to your brazing problem comes to you as a *complete package*. Our engineers provide free start-up service to duplicate laboratory results in your plant . . . fully instruct your staff to assure economical, maintenance-free brazing operations. The end product: a "Results Guaranteed" furnace-atmosphere combination that helps improve your product, increase production, and reduce costs. Write today for Bulletin 5711B describing typical conveyor-type brazing furnace.

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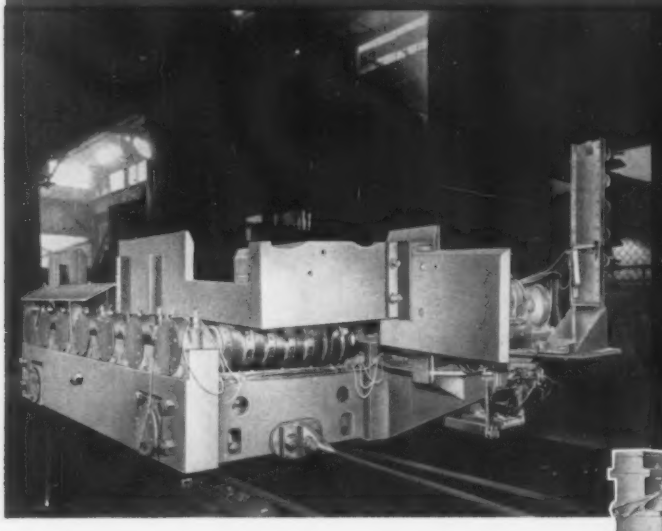
It pays to see **Hayes** for metallurgical guidance, lab facilities, furnaces, atmosphere generators, gas/fluid dryers.

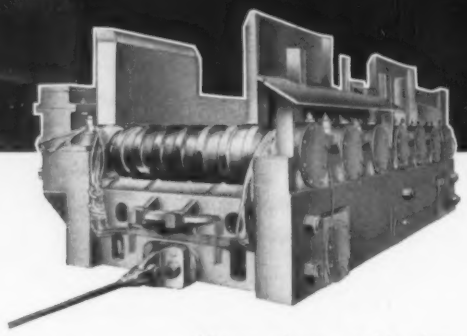
TREADWELL

cable-drawn

table-top INGOT CARS handling two 15-ton ingots... at a speed of 800 ft. *per minute*



Treadwell engineering was called on to develop the speed and efficiency needed for handling heavy ingots at high rates of speed. This ingot car has table rollers that are carried by anti-friction bearings and the axles are anti-friction bearing mounted. Write to Treadwell for any information on ingot cars.



- The table rollers are driven by Cleveland worm and gear sets and a Farval system for lubricating all bearings is built into the car.

Shown above—cable drawn table top ingot car at work in a major steel plant.

TREADWELL

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Special Machinery
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Conveyors, Coil
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Ejectors, Furnace
Gauges, Shear, Saw, etc.
Beds, Cooling,

Mills, Vertical Edging
Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)

CASTINGS—Electric Furnace Steel, Ductile Iron, Gray Iron and Ni-Hard

COMING EXHIBITS

Design Engineering Show — May 25-28, Convention Hall, Philadelphia. (Clapp & Poliak, Inc., 341 Madison Ave., New York 17.)

Material Handling Show—June 9-12, Public Auditorium, Cleveland. (Hanson & Shea, Inc., One Gateway Center, Pittsburgh 22.)

Industrial Finishing Show — June 15-19, Detroit Artillery Armory, Detroit. (Information: H. J. McAleer, 3171 Bellevue, Detroit 7, Mich.)

Instrumentation Show — Sept. 21-25, International Amphitheatre, Chicago. (Instrument Society of America, 313 Sixth Ave., Pittsburgh 22.)

Metal Show—Nov. 2-6, International Amphitheatre, Chicago. (American Society for Metals, 7301 Euclid Ave., Cleveland 3.)

MEETINGS

MAY

Industrial Wire Cloth Institute — Annual resort meeting, May 23-26, The Greenbrier Hotel, White Sulphur Springs, W. Va. Institute headquarters, 75 West St., New York.

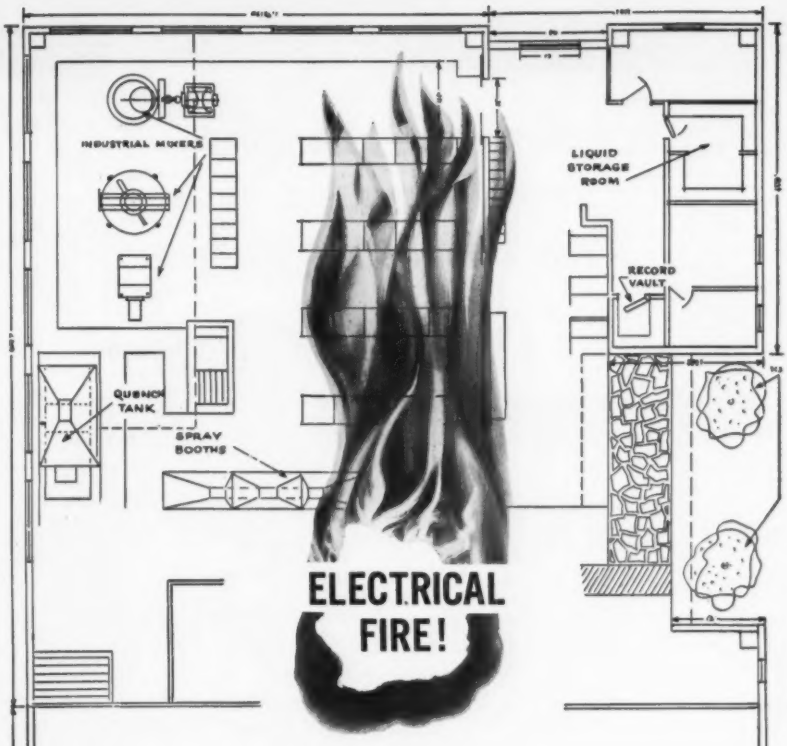
Malleable Founders' Society—Annual meeting, May 25-26, The Homestead, Hot Springs, Va. Society headquarters, 1800 Union Commerce Bldg., Cleveland.

The Commercial Chemical Development Assn. — Spring meeting, May 25-26, Pocono Manor, Mt. Pocono, Pa. Association headquarters, 60 East 42nd St. New York 17.

Wire Reinforcement Institute — Annual spring meeting, May 25-26, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, National Press Bldg., Washington, D. C.

Concrete Reinforcing Steel Institute —Annual meeting, May 25-30, The Greenbrier, White Sulphur Springs, W. Va. Institute headquarters, 38 S. Dearborn St., Chicago.

(Continued on P. 16)



HOT SPOT in *your* plant?

Chances are 1 in 3 that your plant will have an electrical fire this year. Here's how to guard against it.

In a recent nationwide industrial survey, 29% of the reporting plants had one or more electrical fires during the past two years. Best protection against larger electrical fires? Install a fully-automatic Kidde carbon dioxide fire extinguishing system.

Finest fire protection on the market today, Kidde systems give you 24-hour-a-day protection, act quickly, dependably at the first sign of fire. Kidde systems are pressure-operated, self-contained – need no outside power. Visual indicators show if system is "set" or "released." All parts can be tested without discharging system. No parts to replace after operation or test. All operating parts completely enclosed for safety. Fast, clean carbon dioxide snuffs fire in seconds, then vanishes. Leaves no mess to clean up later, can't harm electrical gear. For more information, write for Kidde's Pressurized Systems booklet today.

Kidde (K Kidde) **Walter Kidde & Company, Inc.**
549 Main St,. Belleville 9, N. J.

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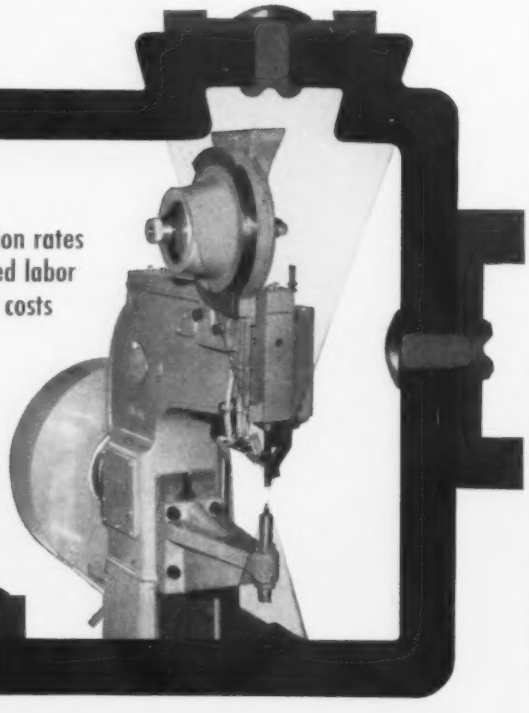
Odd shapes are no problem for the new Townsend Model 75 Tubular Rivet Setting Machine

High production rates using unskilled labor cut fastening costs



Skillfully designed tooling gives complete versatility to the new Townsend Model 75 Tubular Rivet Setting Machine. A variety of specialized tooling is available to equip the Townsend machines for any size and shape of work.

Townsend tubular rivets are available in steel, aluminum, copper, brass, nickel-silver and special materials for use in joining anything from cloth to steel sheets. Thus, Townsend makes available the economies of tubular rivet fastening for a wide range of products in a number of different materials. Townsend's experienced fastening engineers provide application design service.

If you wish to enjoy the economies of fastening with tubular rivets, write for complete information on the versatile Model 75 Setting Machine and the complete line of Townsend tubular rivets. Townsend Company, P. O. Box 237-B, New Brighton, Pa.

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Sales Offices in Principal Cities

In Canada: *Parmenter & Bulloch Manufacturing Company, Limited, Gananoque, Ontario*

EXHIBITS, MEETINGS

(Continued from P. 15)

American Iron & Steel Institute—Annual meeting, May 27-28, The Waldorf-Astoria, New York. Institute headquarters, 150 E. 42nd St., New York.

American Gear Manufacturers Assn.—Annual meeting, May 31-June 3, The Homestead, Hot Springs, Va. Association headquarters, One Thomas Circle, Washington 5, D. C.

JUNE

Institute of Appliance Mfrs.—Annual meeting and exhibit, June 1-3, Netherland Hilton Hotel, Cincinnati. Institute headquarters, Shoreham Hotel, Washington 8, D. C.

Pressed Metal Institute — National sales conference, June 11-12, Bedford Springs Hotel, Bedford, Pa. Institute headquarters, 3673 Lee Rd., Cleveland.

Manufacturing Chemists' Assn.—Annual meeting, June 11-13, The Greenbrier, White Sulphur Springs, W. Va. Association headquarters, 1825 Connecticut Ave., N. W., Washington 9, D. C.

National Assn. of Purchasing Agents—Convention and Inform-A-Show, June 14-17, The Waldorf-Astoria, New York. Association headquarters, 11 Park Place, New York.

The American Boiler Manufacturers Assn. — Annual convention, June 14-17, The Homestead, Hot Springs, Va. Association headquarters, 4062 Mayfield Rd., Cleveland.

The American Society of Mechanical Engineers—Semi-annual meeting, June 14-18, Chase-Park Plaza Hotel, St. Louis, Mo. Society headquarters, 29 W. 39th St., New York.

Alloy Casting Institute—Annual meeting, June 21-23, The Homestead, Hot Springs, Va. Society headquarters, 286 Old Country Rd., Mineola, N. Y.

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GM's no. 1 car—the beautiful Chevrolet Impala

Yes, every one of these 48 precisely-contoured *stainless steel* parts is used on the exterior body trim of the 1959 Chevrolet *Impala*. Here you see beauty, brilliance and strength that resist weather and wear without care for the life of the car—selling and re-selling at every turn. ● We are proud of Superior Stainless Strip Steel's applications in the fine automobiles of General Motors. Can we serve *your* stainless strip needs?

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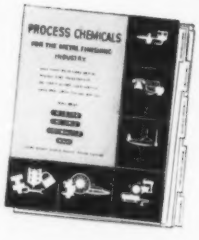

4. WIDER BRIGHT RANGE

ISOBRITE Brighteners operate efficiently over exceptionally wide current density ranges and have greater tolerance for temperature change.

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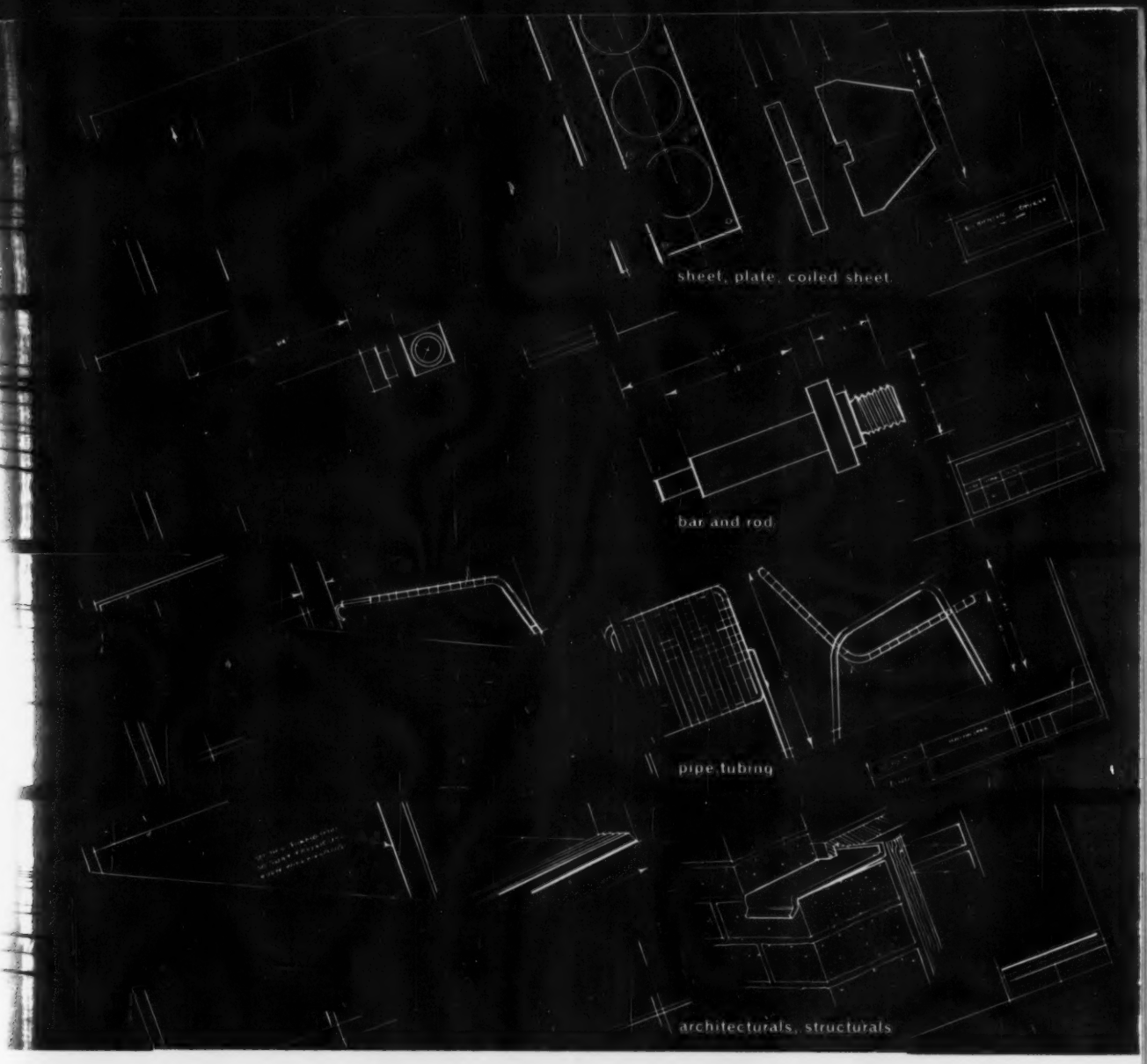

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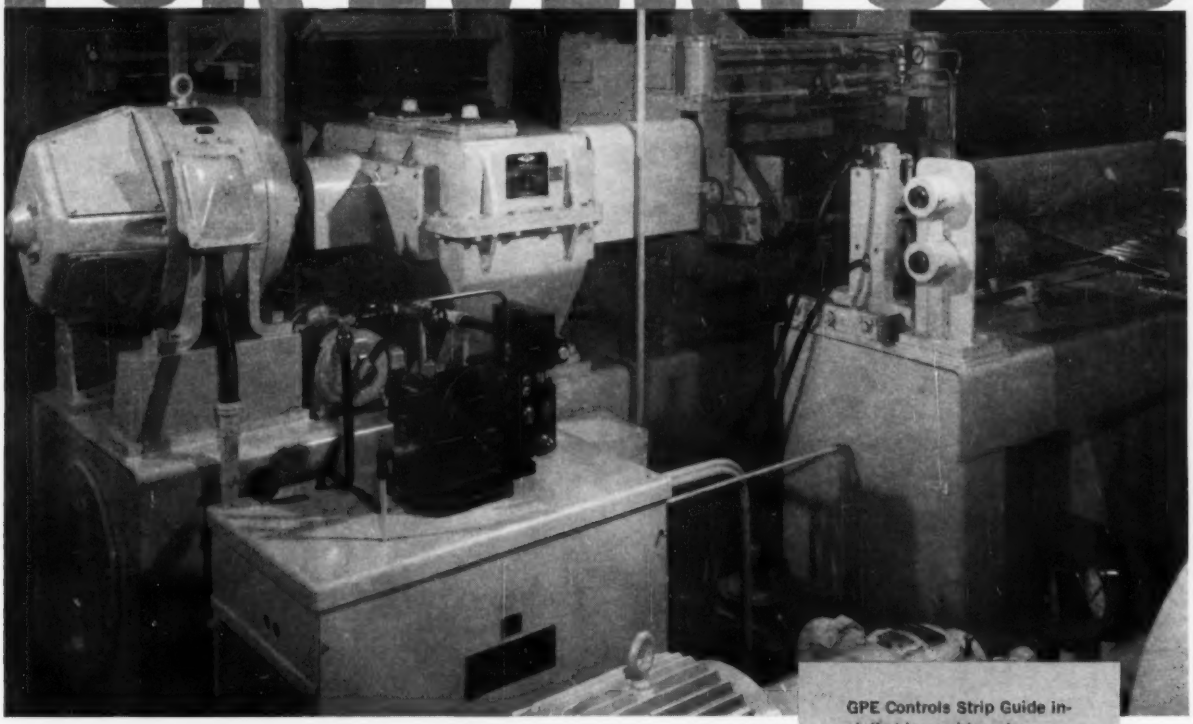

GPE Controls Strip Guide installed in a mid-western can factory, guiding steel into a high-speed sheeter. No part of the control ever touches the strip – just a breath of low-pressure air. Nothing to wear out, nothing to damage highly polished surfaces. Simplified photoelectric sensing also available.

GPE Controls broad line offers speed and power tailored to fit

GPE Controls (formerly Askania Regulator Co.) strip guides are available for every kind of duty – up to the heaviest and fastest mill installations. And every installation is tailored to give you the accuracy of control that comes from plenty of speed and power!

These are the reasons that more and more steel mills, steel processors, warehouses, and equipment manufacturers have turned to GPE Controls for the all-round best in strip guiding equipment. With either air sensing or photoelectric sensing of the strip position, nothing touches the strip. It's the most versatile, most accurate, longest-lasting equipment you can buy—the only strip guide made by specialists in industrial process controls. And it is by far the easiest to operate and maintain.

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GPE Controls, Inc. (formerly Askania Regulator Company)
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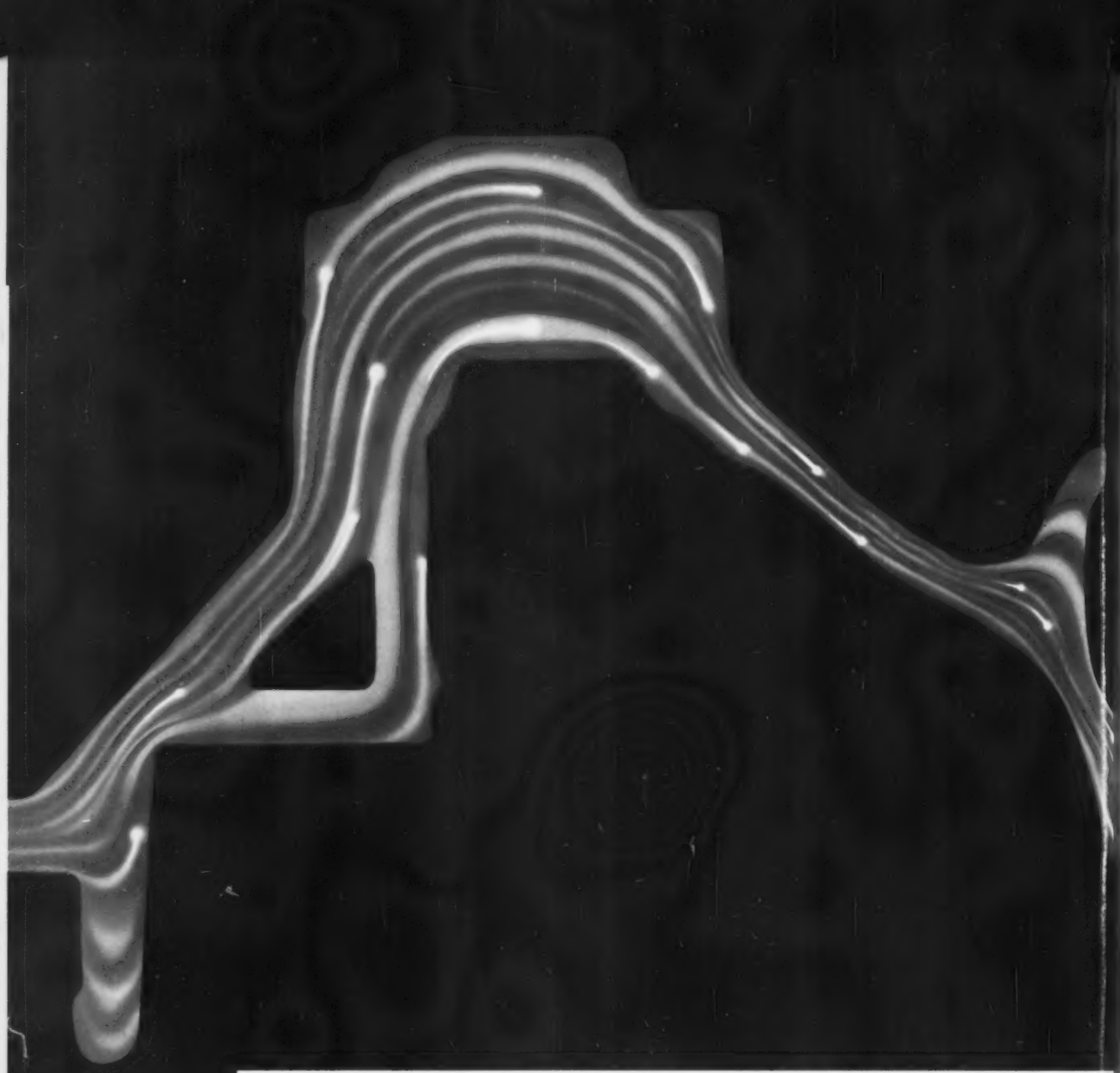

Fluid mapper pattern demonstrating liquid flow through a cross section of a Malleable differential carrier.

Versatility is Malleable

The ability to do most any job well is synonymous with Malleable iron castings. The variety of tasks they perform, from the commonplace to the spectacular, is legend. The strength and toughness . . . the freedom of design . . . the wide range of shapes and sizes . . . the excellent machinability . . . the economies achieved . . . all these advantages of Malleable combine to create an unexcelled reputation for versatility.

Whatever your needs, look first to Malleable.

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If you wish, you may inquire direct to the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio, for information.

Versatility Is Key to Malleable's Increasing Use

Recent metallurgical advances have made the Malleable irons a family of metals uniquely capable of meeting the most diverse design, production and performance requirements. Whether the vital consideration is high strength, toughness, ductility, hardness, machinability, high or low temperature performance, wear resistance, or economy and adaptability for complicated designs, Malleable castings have the versatility to meet exacting specifications.

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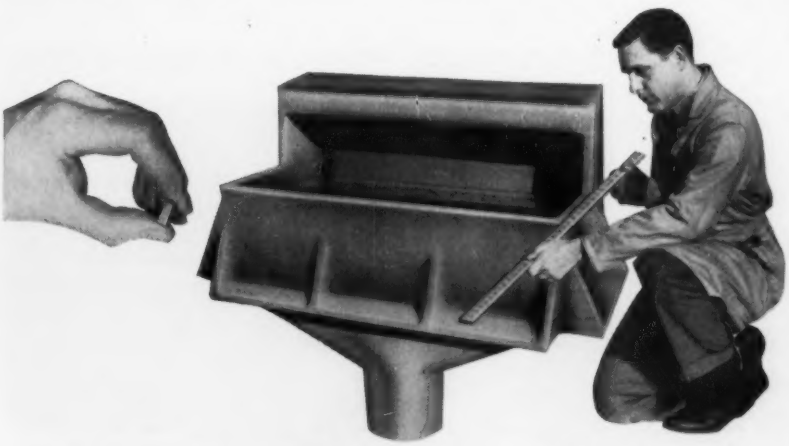
The capabilities of the metal to be cast are of even greater significance, for every application has a different set of requirements. Here, Malleable iron provides unique opportunities to obtain better parts at less cost.

Holes can be punched in Malleable, surfaces can be coined to meet rigid specifications. The pearlitic Malleables can be surface-hardened for even better wear resistance. These and other advantages make today's Malleable iron one of the most versatile engineering materials available.

Although Malleable iron's properties are flexible, depending on service requirements, certain relationships remain constant. Malleable provides more strength and toughness per dollar than any other metal. It is also the most machinable of all ferrous metals of similar properties.



Malleable castings can be produced in sizes ranging from the hammer handle wedge, shown here, weighing less than an ounce, to the 1,125 pound bridge scupper. Throughout this range is an endless variety of castings, best made of Malleable for highest quality at lowest cost.

Shapes and sizes of Malleable castings are virtually limitless. The combination of Malleable's good castability with modern production techniques regularly results in sections as thin as 1/16″ and tolerances of ±.005″ per inch in sections of 1″, with excellent surface finishes.

Engineering Aids Available

While the design of Malleable castings is not complicated, it will pay you to consult a skilled Malleable engineer who can offer time and cost saving suggestions for the production of better parts. As another aid to basic Malleable casting design, a special folder — *Data Unit 104 — Design Versatility* — is available from any member of the Malleable Castings Council and from the Malleable Castings Council, Union Commerce Building, Cleveland 14, Ohio.

These companies are members of the

MALLEABLE CASTINGS COUNCIL

CONNECTICUT
Connecticut Mall. Castings Co., New Haven 6
Eastern Malleable Iron Co., Naugatuck
New Haven Malleable Iron Co., New Haven 4

DELAWARE
Eastern Malleable Iron Co., Wilmington 99

ILLINOIS
Central Fdry. Div., Gen. Motors, Danville
Chicago Malleable Castings Co., Chicago 43
Moline Malleable Iron Co., St. Charles
National Mall. and Steel Castings Co., Cicero 50
Peoria Malleable Castings Co., Peoria 1
Wagner Castings Company, Decatur

INDIANA
Link-Belt Company, Indianapolis 6
Muncie Malleable Foundry Co., Muncie
Terre Haute Mall. & Mfg. Corp., Terre Haute

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Auto Specialties Mfg. Co., Saint Joseph
Cadillac Malleable Iron Co., Cadillac
Central Fdry. Div., Gen. Motors, Saginaw

MINNESOTA
Northern Malleable Iron Co., St. Paul 6

NEW HAMPSHIRE
Laconia Malleable Iron Co., Laconia

NEW JERSEY
Meeker Foundry Company, Newark 4

NEW YORK
Acme Steel & Mall. Iron Works, Buffalo 7
Frazer & Jones Company Division Eastern Malleable Iron Co., Solvay
Oriskany Malleable Iron Co., Inc., Oriskany
Westmoreland Mall. Iron Co., Westmoreland

OHIO
American Malleable Castings Co., Marion
Canton Malleable Iron Co., Canton 5
Central Fdry. Div., Gen. Motors, Defiance
Dayton Mall. Iron Co., Ironton Div., Ironton
Dayton Mall. Iron Co., Ohio Mall. Div., Columbus 16
Maumee Malleable Castings Co., Toledo 5
National Mall. and Steel Castings Co., Cleveland 6

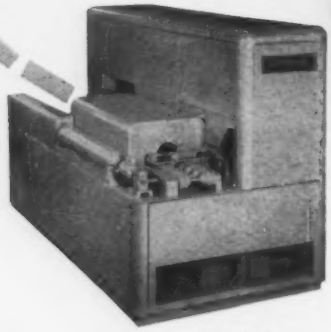
PENNSYLVANIA
Buck Iron Company, Inc., Philadelphia 22
Erie Malleable Iron Co., Erie
Lancaster Malleable Castings Co., Lancaster
Lehigh Foundries Company, Easton
Meadville Malleable Iron Co., Meadville
Pennsylvania Malleable Iron Corp., Lancaster

TEXAS
Texas Foundries, Inc., Lufkin

WEST VIRGINIA
West Virginia Mall. Iron Co., Point Pleasant

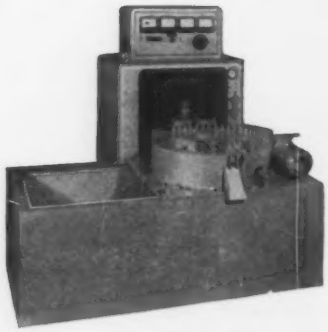
WISCONSIN
Badger Malleable & Mfg. Co., S. Milwaukee
Belle City Malleable Iron Co., Racine
Chain Belt Company, Milwaukee 1
Federal Malleable Company, West Allis 14
Kirsh Foundry Inc., Beaver Dam
Lakeside Malleable Castings Co., Racine
Milwaukee Malleable & Grey Iron Works, Milwaukee 46

60 Cycle
Non-Ferrous Melting



60 Cycle
Billet Heating

High Frequency
Melting



High Frequency
Heat Treating

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THIS IS OUR ANSWER TO INDUSTRY'S NEED FOR A FULLY INTEGRATED INDUCTION HEATING COMPANY. EACH COMPANY IS A LEADER IN ITS OWN SPECIALTY OF THE INDUCTION HEATING FIELD.

WE'VE JOINED TO MAKE A COMPLETE LINE OF INDUCTION HEATING PRODUCTS AVAILABLE FROM ONE SOURCE—TO PROVIDE AN AGGRESSIVE RESEARCH PROGRAM THAT WILL MEAN NEW AND BETTER PRODUCTS—TO ENABLE US TO SERVE INDUSTRY BETTER WITH A DECENTRALIZED SALES AND SERVICE ORGANIZATION OF MEN WHO ARE EXPERTS IN THEIR FIELD.

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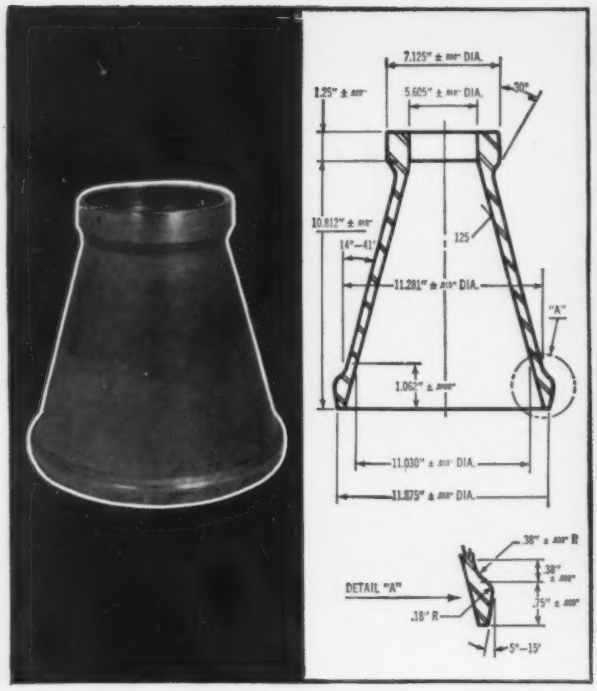
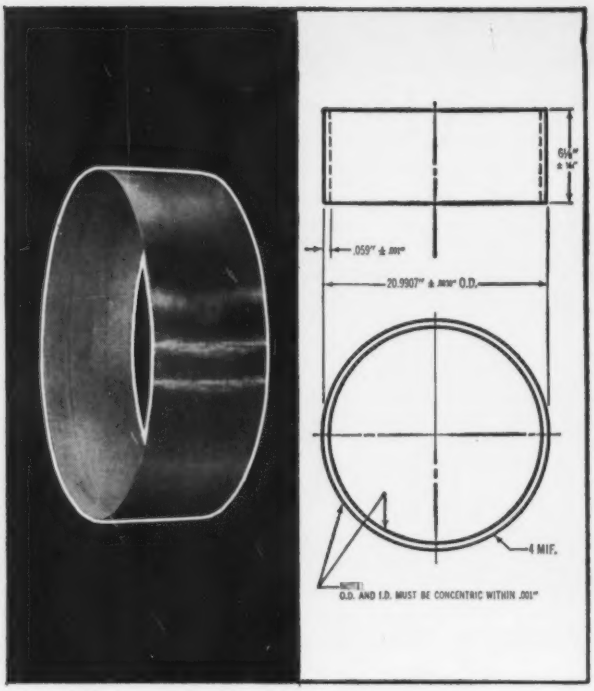


STRAIGHT SIDE ROCKET CONE—Spun with tapered wall from 1020 steel blank: 18" diameter, 1" thick. Inside surface 125 MIF.



STRAIGHT WALL TUBE PRINTING BAND—Spun from ⅛" thick aluminum to .060" wall thickness, outside surface machine finished to 4MIF.

ROTOFORMS open new

ROTOFORMING reduces cost of unusual metal shapes—saves metal, eliminates machining and surface finishing

The design possibilities for hollow metal shapes are now unlimited. The most unusual metal custom parts can be practically and economically produced by ROTOFORMING.

This revolutionary new metal forming service now being offered by COMMERCIAL SHEARING & STAMPING displaces metal in a blank or preform. Rollers contacting the outside surface of the metal form it by high pressure as it rotates around a mandrel. The shape of the mandrel itself, at all times, controls the inside contour and size of the part.

WHAT SHAPES ARE POSSIBLE? Basically, ROTOFORMS can be grouped into four main categories: Straight-Side Cones, Straight-Wall Tubes, Curvilinear-Wall Shapes, and Elliptical or Hemispherical Shapes. Pictured above are representative ROTOFORMS already produced by COMMERCIAL. Principal dimensions are included.

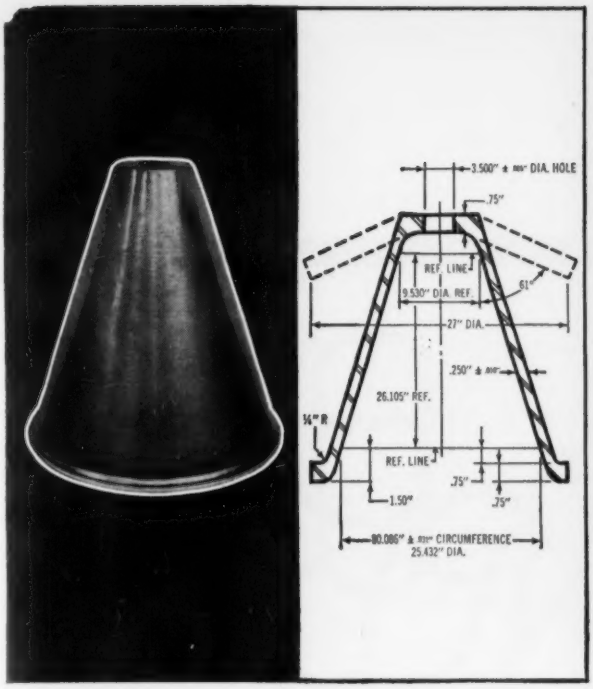
WHAT ABOUT SIZE AND WALL THICKNESS? The range of sizes for ROTOFORMS covers maximum diameters up to 42" down to a minimum tube I.D. of 2¼". Tube length can go as high as 100".

Steel blanks up to ¾" thick can be successfully handled by ROTOFORMING where conical shapes are involved. And when it comes to forming straight-wall tubes the wall thickness of steel blanks can even go up to ⅝". When forming metals more ductile than steel it is possible to work blanks with even greater wall thicknesses than those above.

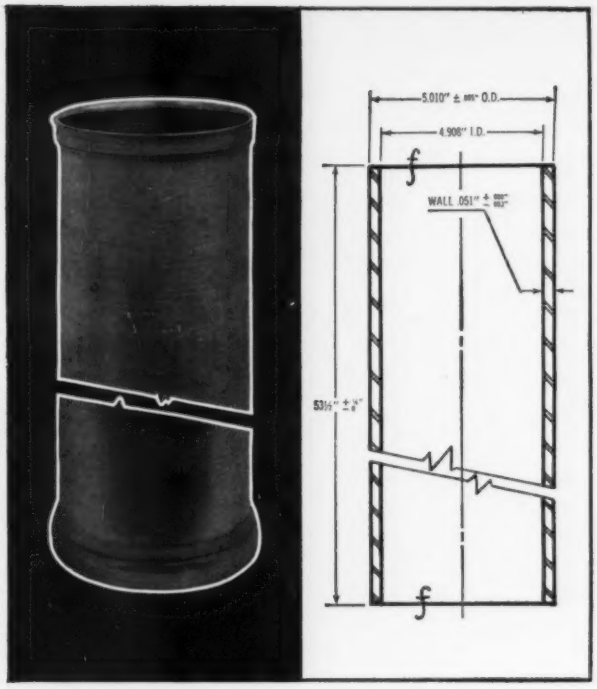
With ROTOFORMS wall thicknesses—both constant and variable—are feasible. Walls referenced to C/L can be straight, curved, or tapered. And ROTOFORMS have been successfully produced with a finished wall thickness no greater than 1/32".

WHAT METALS CAN BE ROTOFORMED? A wide variety of carbon steels, stainless and special alloy steels, as well as aluminum, nickel, copper, molybdenum, magnesium and titanium alloys can be successfully ROTOFORMED. Even metal alloys such as 4130 steel, 1100-0 aluminum, and hard to machine Hastelloy, can and are being used in the regular production of ROTOFORMS.

WHAT HAPPENS TO THE METAL? The plastic deformation which metals undergo in the ROTOFORMING process elongates their grain structure and sub-



STRAIGHT SIDE MISSILE EXIT CONE—Spun with constant wall thickness from press pre-formed 1040 steel blank: 29" diameter, ¾" thick.



STRAIGHT WALL ROCKET TUBE—Spun from 4135 steel tubing (wall thickness ½") reduced to finished wall .051".

horizons for metal shape design!

stantially increases their strength. Tensile increases 1½ to 2 times, yield point is raised in even higher proportion, and fatigue strength is substantially improved. And ROTOFORMED parts can be heat treated to increase their ductility.

Because of the plastic deformation of metal, involved weld joints become unnoticeable when ROTOFORMED. And there are no hidden metal flaws in ROTOFORMS. Any metal inclusions or flaws in the parent metal are quickly uncovered during the ROTOFORMING process—appear as ruptures when pressure spinning rolls reposition the metal by physical displacement. Only 100% sound metal will produce successful ROTOFORMS.

WHAT ABOUT TOLERANCES AND FINISHES? Extremely close tolerances and tolerances commonly associated with fine machining are routine in the production of ROTOFORMS. It is not uncommon for ROTOFORMED parts taken from the machine as is to have inside diameters held to tolerances of +.000" −.003", +.005" −.000", and +.005" −.005".

Inside areas of ROTOFORMS finish to a glass-like surface—30 to 60 micro inch finishes being well within standard production practice. While outside surfaces finish to about 125 micro inch.

Because dimensional tolerances and inside surface finish have a direct relation to the variation and finish of blank from which the ROTOFORM is produced, when necessary the tolerances of a blank can be reduced and its finish improved beforehand in order to provide closer tolerances and a better inside finish in the actual ROTOFORM. In addition, the outside surfaces of ROTOFORMS can be brought to smoother finish by grinding, polishing or fine machining.

AN INVITATION FROM COMMERCIAL! This new metal forming process could be the practical and economical answer to your particular component problem. You can find out very quickly. Just a blueprint, sketch or prototype of your part in the hands of our engineers will bring you the complete cost-saving story—and at no obligation. Address inquiries to Commercial Shearing & Stamping Co., Dept. K-21, Youngstown 1, Ohio.

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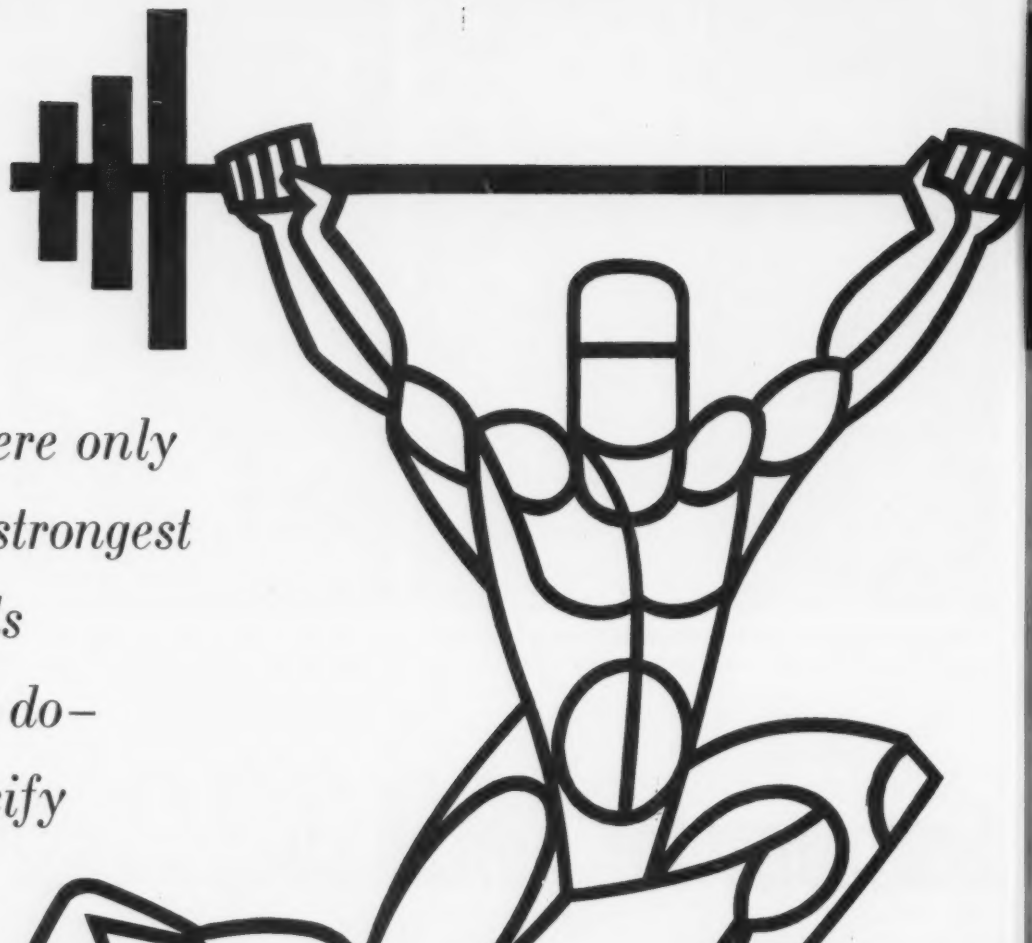

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the strongest
steels
will do–
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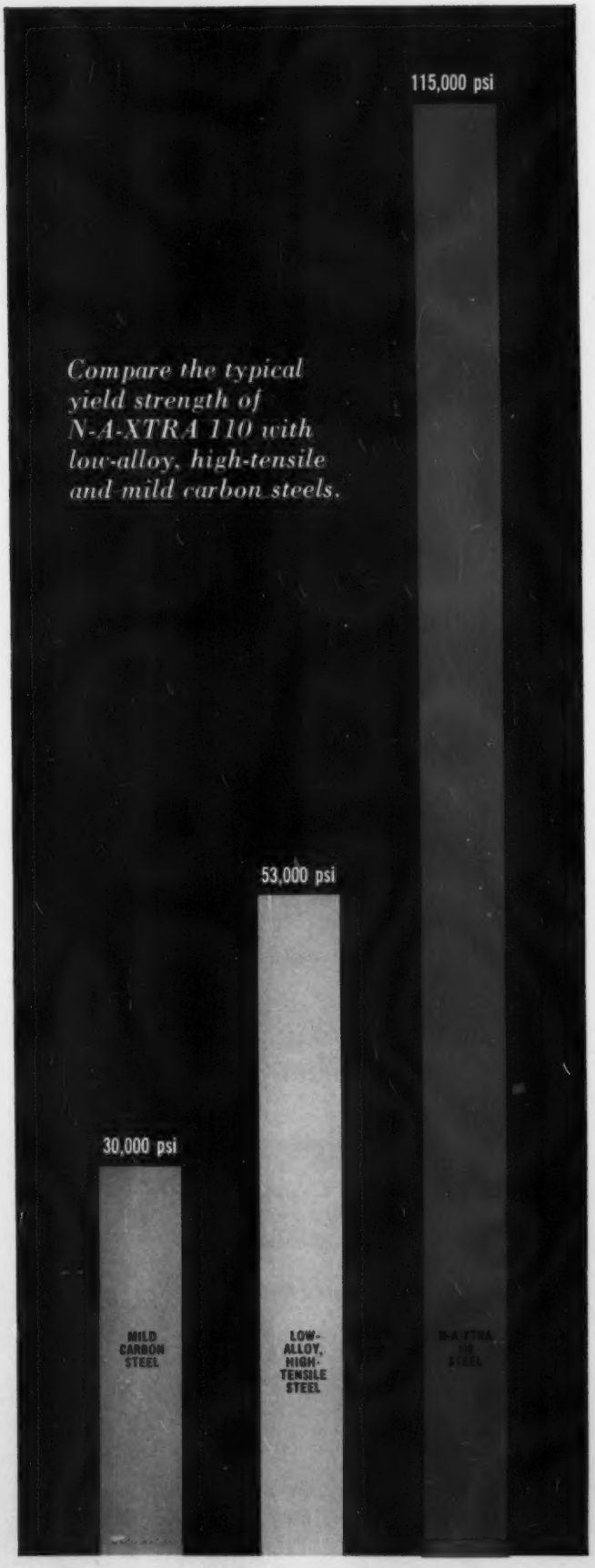
115,000 psi
Compare the typical yield strength of N-A-XTRA 110 with low-alloy, high-tensile and mild carbon steels.
53,000 psi
30,000 psi
MILD CARBON STEEL
LOW-ALLOY, HIGH-TENSILE STEEL

Now available, N-A-XTRA HIGH-STRENGTH is a low-alloy heat-treated steel, fully quenched and tempered. The minimum yield strength range of N-A-XTRA steel is from 80,000 to 110,000 psi.

The great strength of N-A-XTRA (nearly three times that of mild carbon steels) gives designers the opportunity to eliminate costly dead weight from your products.

N-A-XTRA is tough at normal and subnormal temperatures. It can be readily cold formed into difficult shapes. And it welds beautifully by any process—with no underbead cracking. For a job where only the strongest of steels will do . . . specify N-A-XTRA HIGH-STRENGTH steel.

Write today for your copy of new illustrated technical brochure. Address Great Lakes Steel Corporation, Detroit 29, Michigan,.Dept. A-6.

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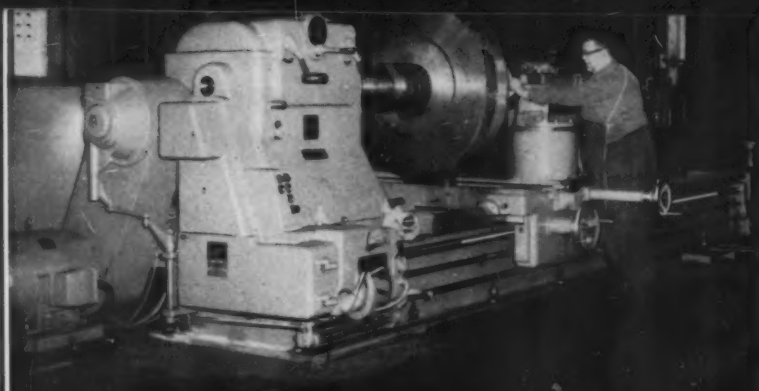
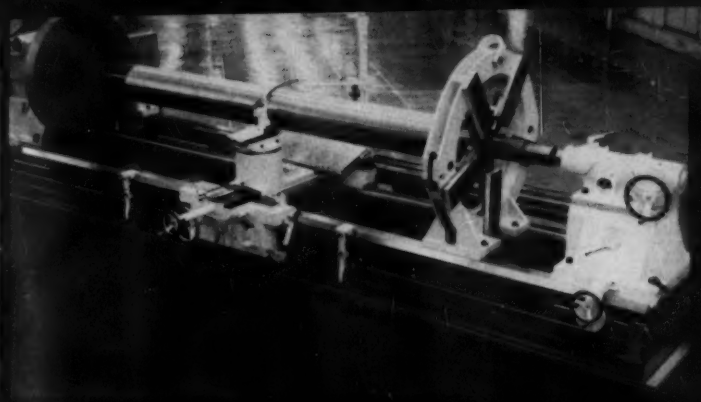


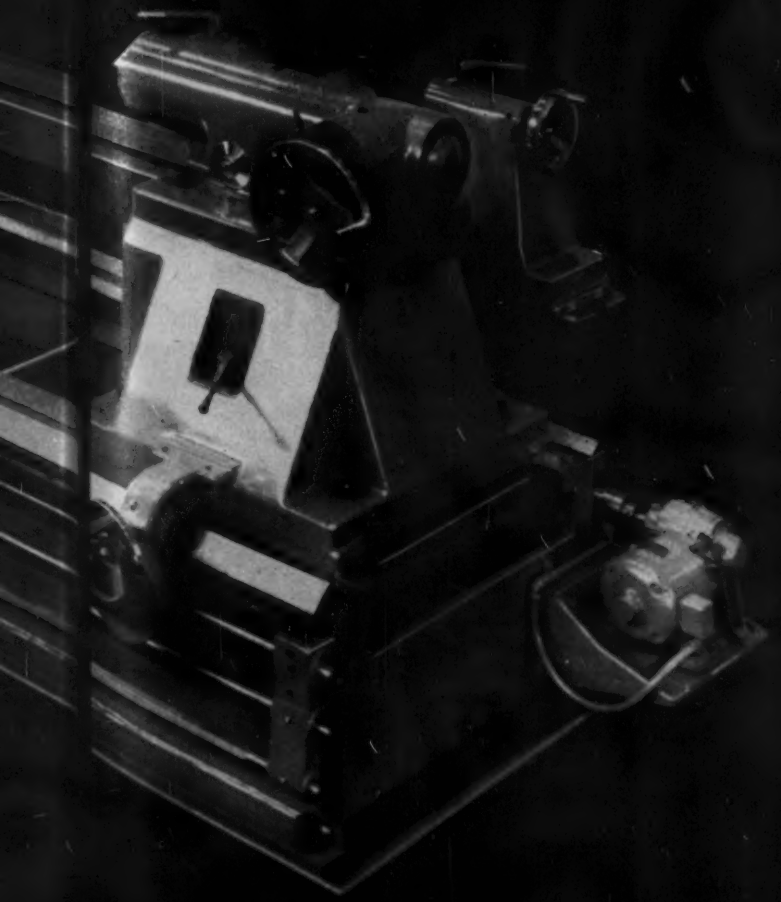
A large missile component being tracer-machined at a major West Coast missile plant on a Space-Master with 60″ swing and 21′ centers.

This Sidney Space-Master is contouring steel rolls up to 50″ diameter to close tolerances.

Close-up of the Sidney Fluid Tracer with periscope mirrors which permit watching the tracer while machining large work.



for high precision
on large parts



Introducing the SIDNEY SPACE MASTER©

With swings up to 72 inches and center distances up to 51 feet, the Sidney SPACE-MASTER© is the answer for those manufacturers looking for precision on large MISSILE AND ROCKET PARTS.

Available with or without the Sidney Fluid Tracer, the Space-Master is full of precision-insuring and time-saving features. Here are some of them:

- **Lapped herringbone gear headstock**
- **60 thread and feed changes**
- **Powerful rapid traverse**
- **Double-walled apron**
- **Massively bridged bed**
- **Large support areas throughout for carriage, slide, tailstock, etc.**
- **Heat-treated lathe rack**
- **Graduated dial to measure tailstock spindle travel**
- **Honed tailstock bore**
- **Anti-friction bearings**
- **Periscope mirrors for Tracer when machining large parts**

If you want to speed output, hold your tolerances down (to ± .001) and cut your cost, it will pay you to look into the Sidney Space-Master. Ask for Bulletin #S-600.

SIDNEY MACHINE TOOL CO.
SIDNEY, OHIO
Wholly owned subsidiary of Buhr Machine Tool Co.

Bearings in the making are these lengths of Pittsburgh seamless mechanical tubing in the charging rack of a high-speed automatic cutting machine at the plant of a leading bearing manufacturer. Special machining, hardening properties are built into tubes for this customer who produces more than 6,000 inner-rings per day.

Leading Bearing Maker Finds . . .

Machinability of Pittsburgh Steel's Tubes Lengthens Tool Life, Gives More Pieces

One of the nation's oldest and largest ball bearing makers used alloy bars for high-speed machining of a difficult bearing part for 20 years.

But when Pittsburgh Steel Company showed how low-carbon steel tubes could provide the machining and case-hardening properties required, this big-name manufacturer switched to Pittsburgh seamless mechanical tubing.

These were the clinchers:

- **More pieces per day**
- **Longer tool life**
- **Less machining and scrap**
- **Lower cost material**

The part involved was the inner-ring of a clutch throw-out bearing—a heavy production item at this customer's biggest plant since 1937. The bearing is the part that takes the abuse from the spinning clutch pressure-plate when you step on the clutch pedal.

To produce the inner-ring from low carbon steel, the customer demanded seamless tubing that was:

Highly machinable and uniform—for charging into a battery of 8-spindle automatic screw machines which subject each piece to 16 cutting operations.

Exceptionally hardenable and fine grained—for heat-treating to the hardness demanded of bearing steel and for finishing to ultra-close tolerance and super-fine surface.

The customer specified the grade of steel he needed to obtain these properties—AISI C-1024—then asked Pittsburgh Steel's sales engineers to produce it in seamless mechanical tubing.

The bearing maker's automatic machines produce 6,000 to 6,500 bearing inner-rings a day, testing the tubing's machinability with cutting tolerances as little as .003 inch.

Its hardening properties are

proven in a 21½-hour carburizing-hardening-temper cycle.

Structural characteristics meet the test in an integrated finishing-assembly operation that includes grinding and honing, and two 100 percent test operations.

The bearing maker's superintendent of primary operations sums up the advantages of Pittsburgh Steel's mechanical tubing this way:

"We get more pieces during a day's operation. And we don't have as many chips to pull.

"We can use a boring tool and this stays in service longer than the drill needed for bar stock. Other tools used for ID cuts also stay in longer. So there we have lower tool costs.

"Finally, we are using a less expensive steel and gaining cycle speed. Since the inside drill speed is the controlling factor on cycle speed for bar stock, the elimination of this operation and the substitution of a boring tool permits cycle speeds of 25 seconds for tubing compared with 28 seconds for alloy bar stock or a little over 10 percent reduction."

This customer's experience with Pittsburgh Steel's seamless tubing—the advantages, the quality, the results—is typical of Pittsburgh Steel's ability to supply tubular products for special applications and of its ability to help customers obtain more profitable production.

These same benefits can be tailored to the needs of your operation requiring seamless mechanical tubing or any of the other tubular products made by the skilled tubemakers at Pittsburgh Steel Company.

Initial assembly—one of two 100 percent testing operations—is where seamless shows its merits in finished bearing.

Tubing proves its machinability here where it takes 16 boring, reaming, grooving, recessing and burnishing cuts.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
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Drummond McCall & Co., Ltd.
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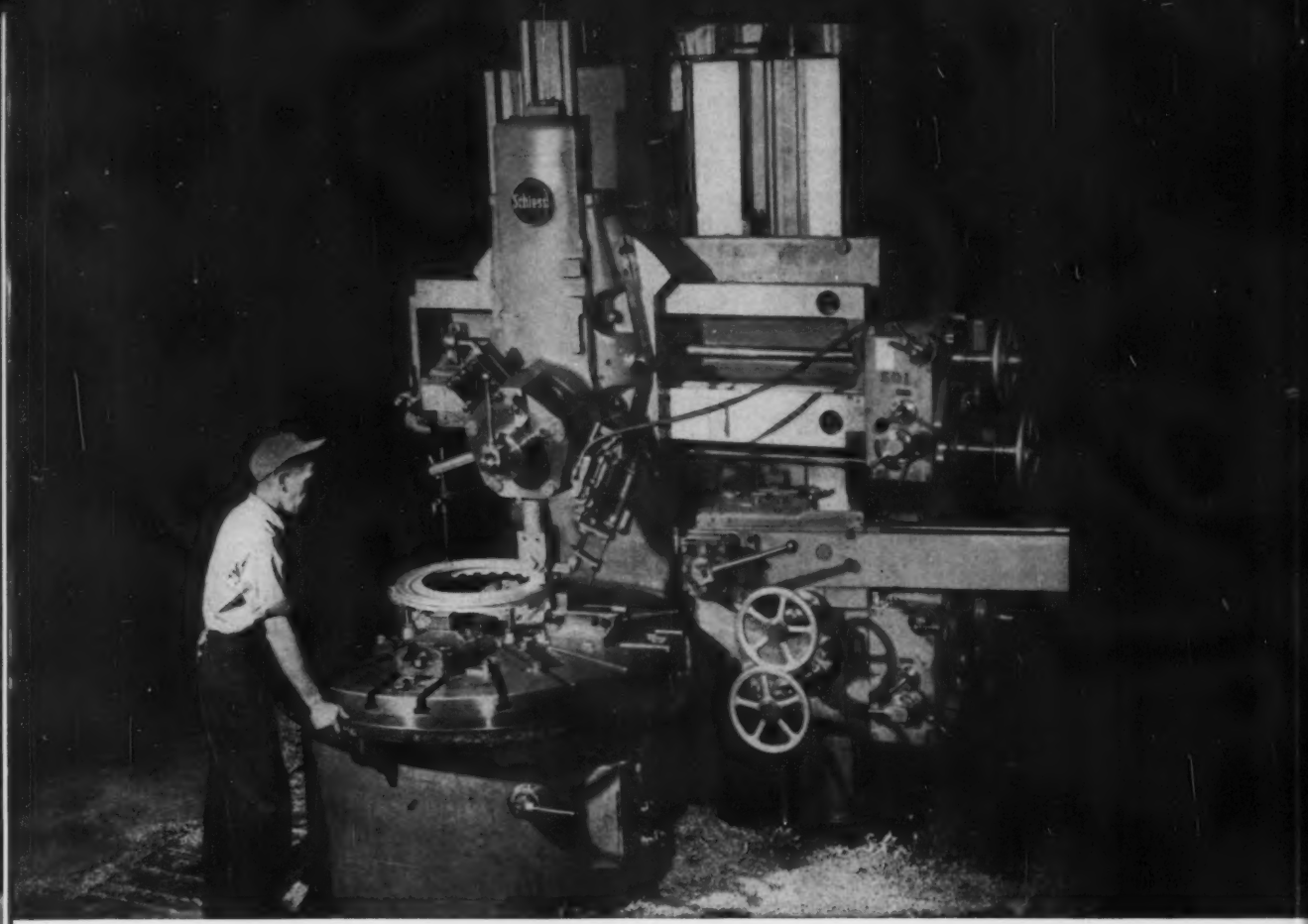

"Now, with our Schiess vertical turret lathe

one 8-hour shift does the work of three!"

says Arnold R. Kline, plant manager, O.K. Rubber, Inc., Littleton, Colo.

Schiess 13EK-150 Vertical Turret Lathe turning a 33 in. "Nu-Matic" tire mold sidewall plate, made of #12 cast aluminum.

"Production on sidewall tire molds jumped 300%. Material spoilage was reduced 50 to 60%. Per unit cost dropped 60%. And we have a better machined end product!" That's the way Arnold Kline wraps up the production story at O.K. Rubber, since he installed this Schiess machine.

He continues: "We've got the Schiess mill doing everything from boring 1¼ in. holes to turning plates 56 in. in diameter. We thought we'd need a custom-made mill to do our kind of work. We don't think that way any more."

"And frankly, we were amazed at the price—30 to 40% lower than we expected!"

No costly training time was needed. Skilled machinists were checked out on the mill in just a few hours. Operators particularly liked the horizontal head, the rapid traverse lever, the cross-rail mechanical controls. All contributing to greater accuracy . . . better finish . . . less machining time.

Get to know this and other products of Europe's largest builder of heavy machine tools. Parts and service are as close as Pittsburgh. An American Schiess engineer will be happy to help you select the proper tool for your production needs. Write today.

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of Heavy Workpieces in one set-up . . . on one machine

- Reduces machining time
- Reduces set-up time
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- Cuts manufacturing costs

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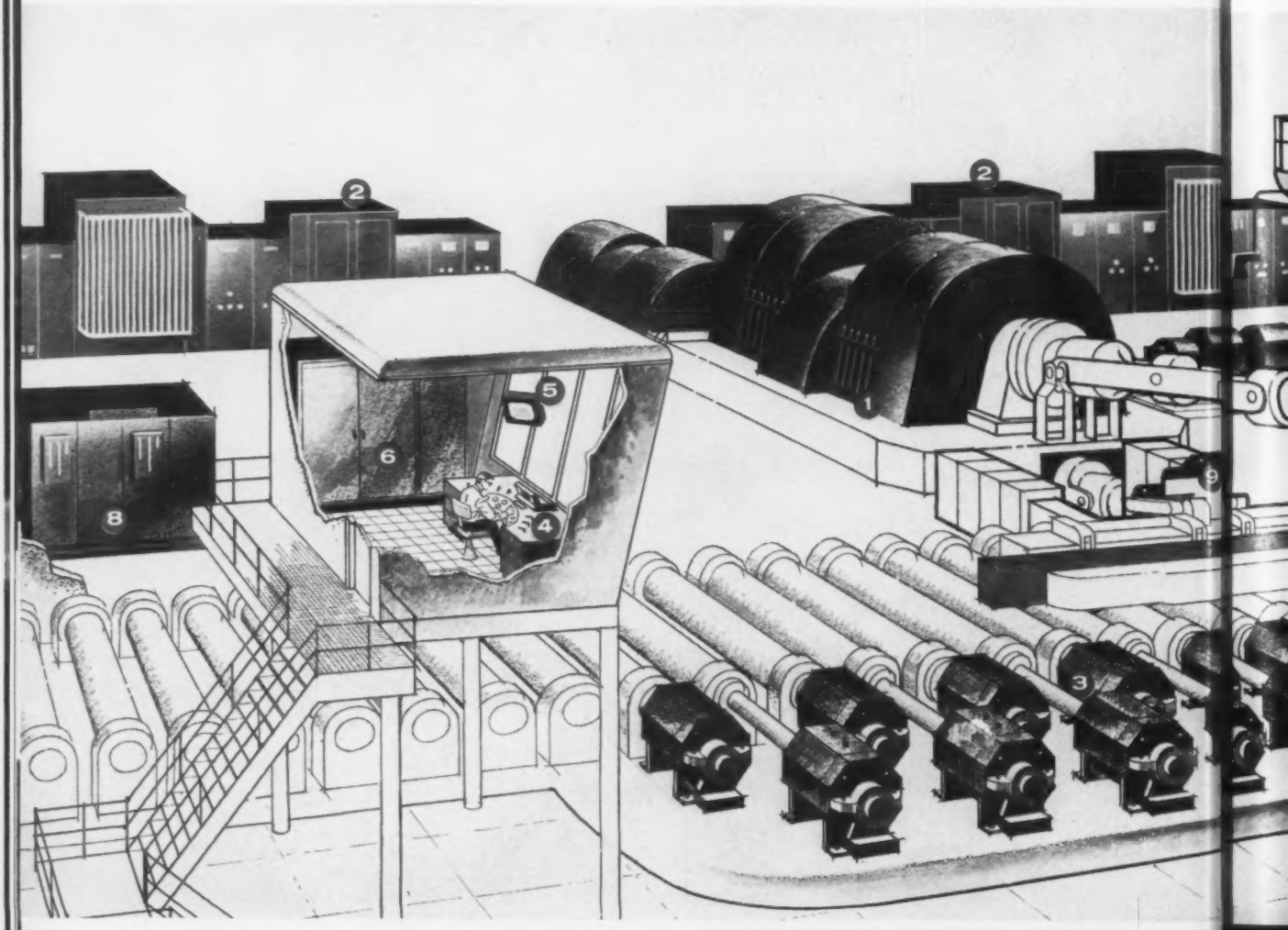
General Electric's new program for Automation through Modernization can help you . . .

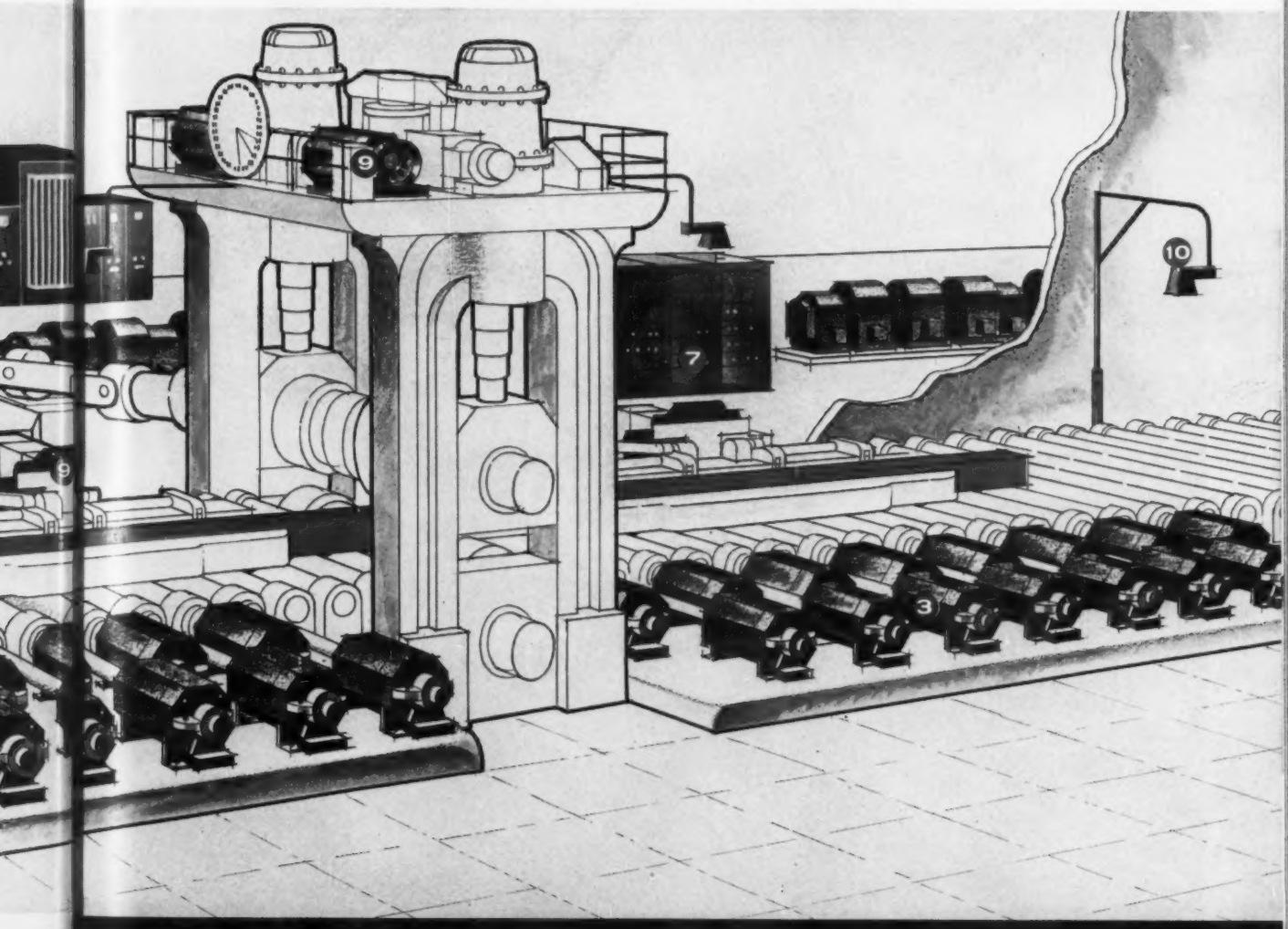
REDUCE OPERATING COSTS, MODERNIZE FOR PROFITS



Above is General Electric's version of a completely automated reversing hot mill. While your facility may differ, the products and technology for automation are available from General Electric today.

1. ***"TOP-FORWARD"*** arrangement of main drive motors combines accessibility and easy maintenance features with reduced installation and construction costs.
2. Either mercury-arc rectifiers or motor-generator sets, depending upon operating conditions, provide reliable d-c power to main drive motors.
3. MD-600 motors power individual rolls, eliminate reduction and bevel gears, lower maintenance.
4. Operator's control console provides finger-tip control of entire mill operation.
5. Closed-circuit TV gives operator visual contact with remote and inaccessible mill operations.
6. Data processing equipment can record data, set up operating guides, and ultimately control the process using the GE 312 general purpose, digital control computer.
7. Main mill control utilizes quick-response *DIRECTO-MATIC* static control to provide specific direction during the short time required for mill reversals.
8. *DIRECTO-MATIC* static program control equipment provides fast, precise control of system operations based on pre-determined schedules.
9. Rugged MD-600 motors provide instant response and minimum of maintenance to the most vital mill operation.
10. Hot metal detectors note when metal is "in zone," initiate next step in operation. This saves rolling time, increases accuracy.

Implementation of General Electric's "Ring of the Future" will take you through the comparatively low-cost steps of modernization to practical automation of your reversing hot mill. Increased process and system efficiency will result in reduced operating costs. Greater speed and more precise control will minimize your non-productive rolling time, increase yield. For full information on Automation through Modernization, write today for General Electric's "Ring of the Future"* kit.



THE "RING OF THE FUTURE" KIT IS GENERAL ELECTRIC'S GUIDE TO AUTOMATION THROUGH MODERNIZATION.

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Please send me G.E.'s "Ring of the Future" kit.

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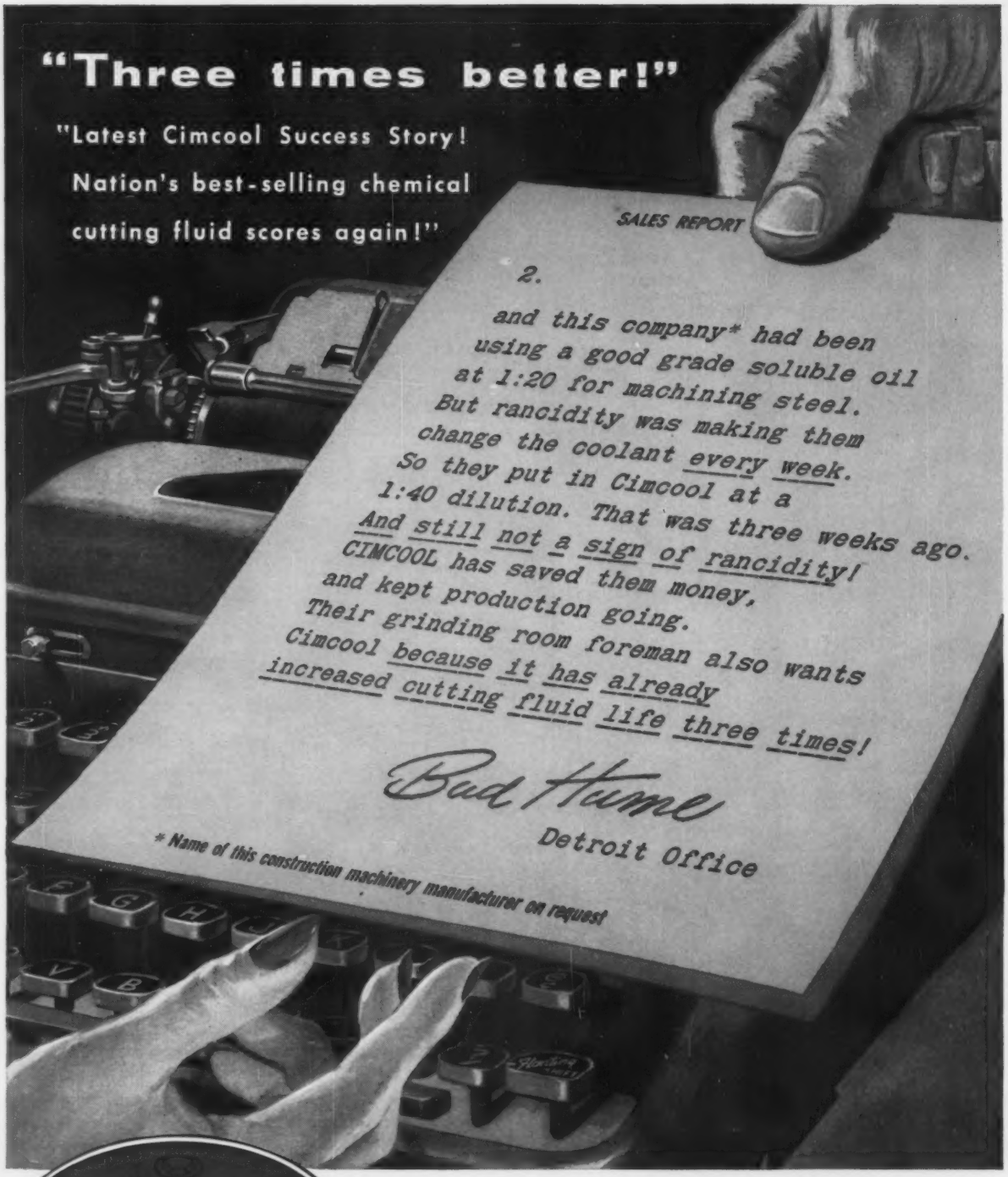
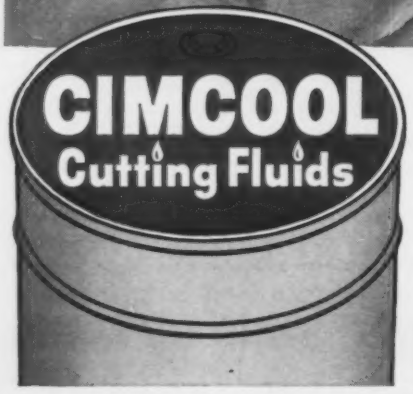
Automation Through Modernization

GENERAL ELECTRIC


"Three times better!"
"Latest Cimcool Success Story!
Nation's best-selling chemical
cutting fluid scores again!"
SALES REPORT
2.
and this company* had been
using a good grade soluble oil
at 1:20 for machining steel.
But rancidity was making them
change the coolant every week.
So they put in Cimcool at a
1:40 dilution. That was three weeks ago.
And still not a sign of rancidity!
CIMCOOL has saved them money,
and kept production going.
Their grinding room foreman also wants
Cimcool because it has already
increased cutting fluid life three times!
Bud Hume
Detroit Office
* Name of this construction machinery manufacturer on request



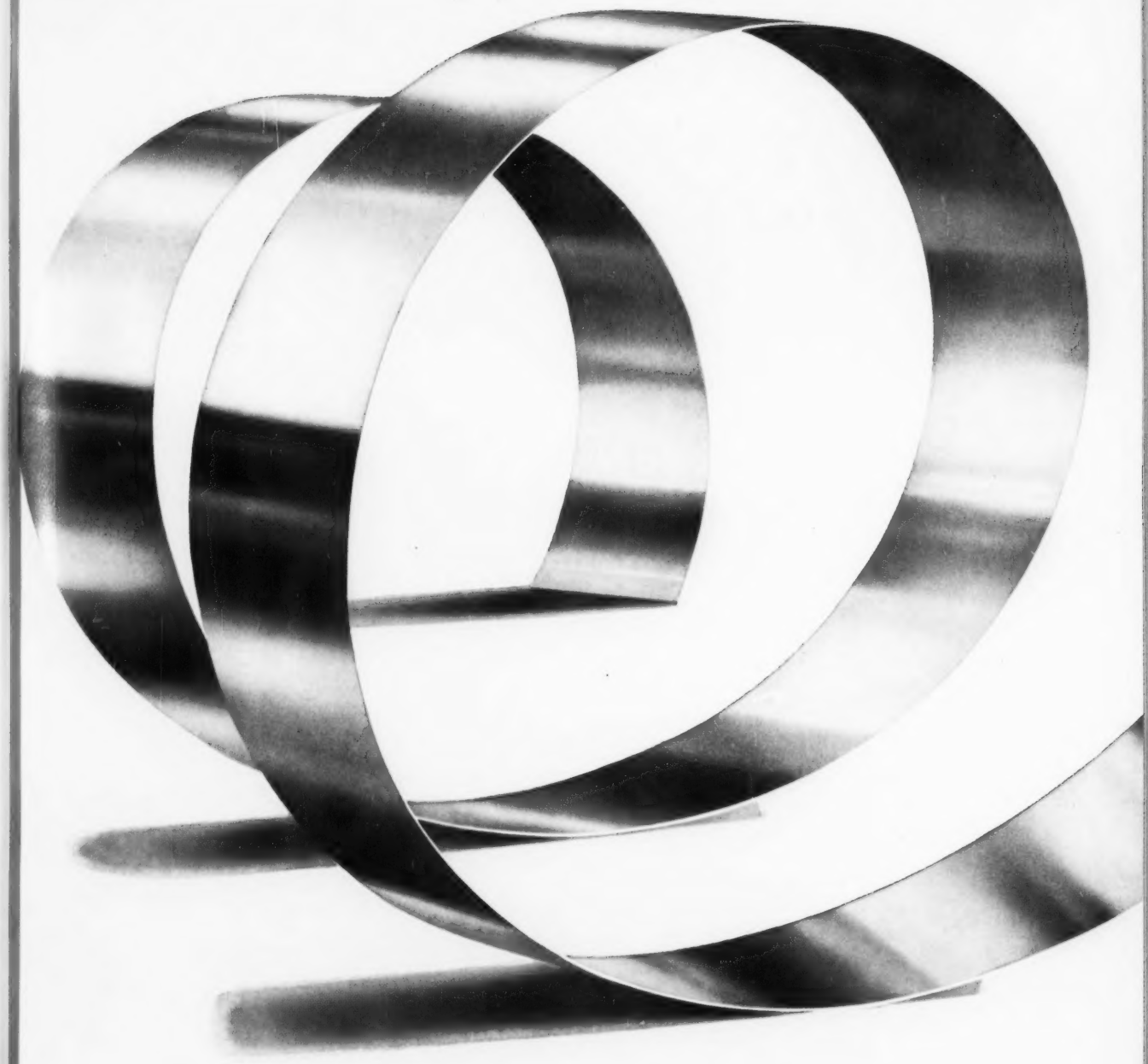
FOR 100% OF ALL METAL CUTTING JOBS

Production-proved products of The Cincinnati Milling Machine Co.

CIMPERIAL—*newest* in the famous, industry-proven line of CIMCOOL® Cutting Fluids!
CIMCOOL 52 Concentrate—The pink fluid which covers 85% of all metal cutting jobs.
CIMPLUS—The transparent grinding fluid which provides exceptional rust control.
CIMCUT Concentrates (AA, NC, 55)—For every job requiring an oil-base cutting fluid.
ALSO—CIMCOOL Tapping Compound—CIMCOOL Bactericide—CIMCOOL Machine Cleaner.

For full information on the complete family of CIMCOOL Cutting Fluids, call your CIMCOOL Distributor, or contact Cincinnati Milling Products Division, Cincinnati 9, O.

*Trade Mark Reg. U.S.Pat. Off.



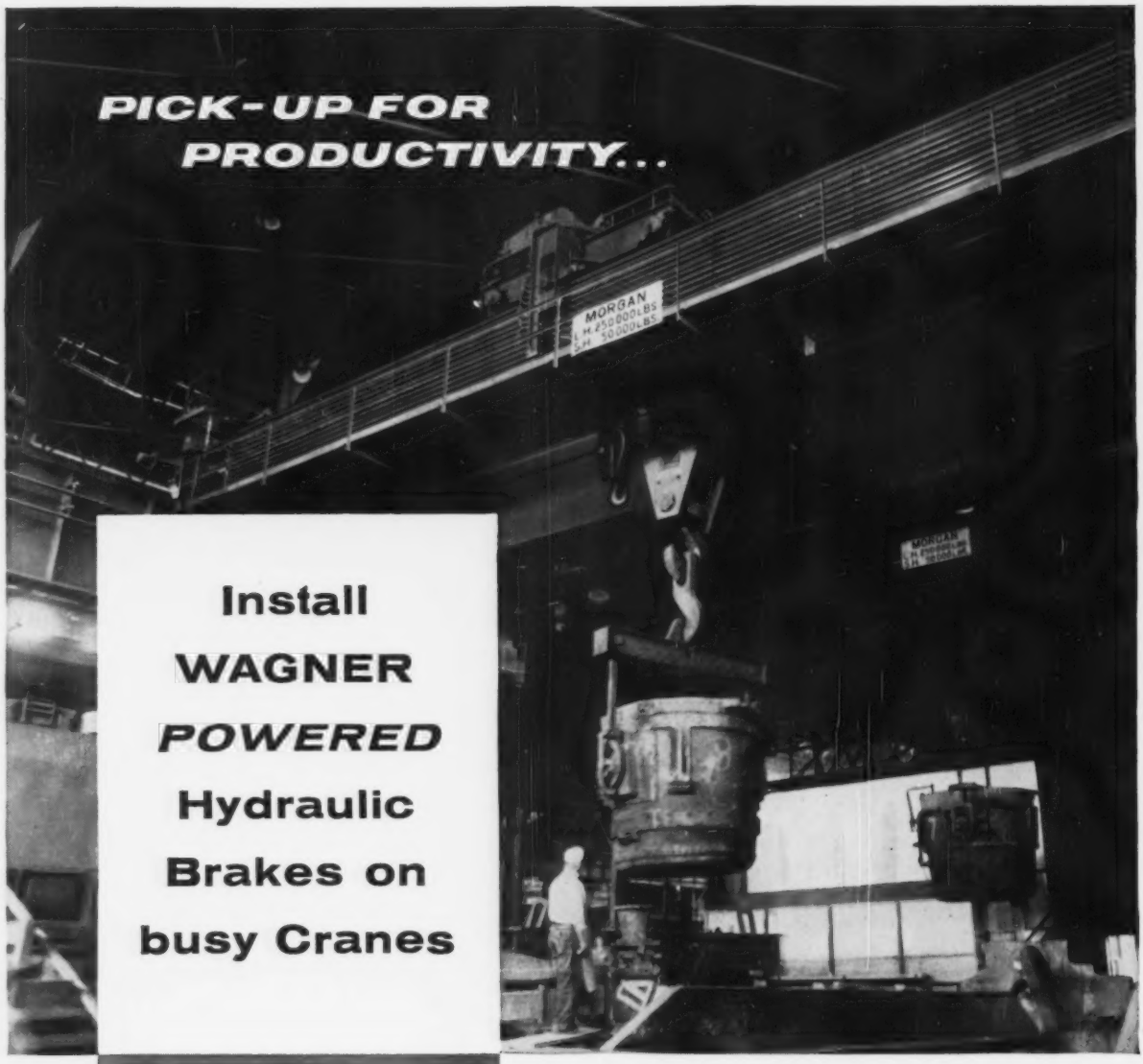
Crucible stainless matches your high standards

Coil after coil of Crucible stainless gleams with unsurpassed lustre because it is precision-rolled on modern mills. Furthermore, Crucible maintains uniform qualities by methodically checking each heat — and ensures precise gauge with electronic measuring controls. For stainless in all gauges down to .010" and in all strip widths, call or write: Crucible Steel Company of America, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.

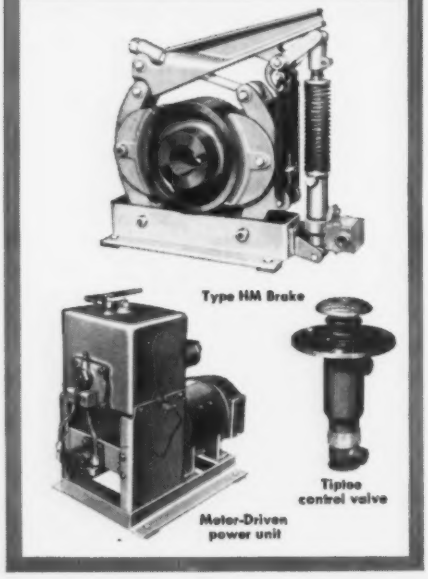
CRUCIBLE STEEL COMPANY OF AMERICA

CANADIAN DISTRIBUTOR — RAILWAY AND POWER ENGINEERING CORP., LTD.

PICK-UP FOR PRODUCTIVITY...



Install WAGNER *POWERED* Hydraulic Brakes on busy Cranes



Some of your cranes are VIP's (very important producers). You can increase productivity by equipping these busy cranes with Wagner *Powered* Hydraulic Crane Bridge Brakes.

Powered hydraulic braking gives safer, more efficient operation where frequent starts and stops are necessary . . . where close spotting is required . . . where heavy equipment is involved . . . for any extra busy heavy crane.

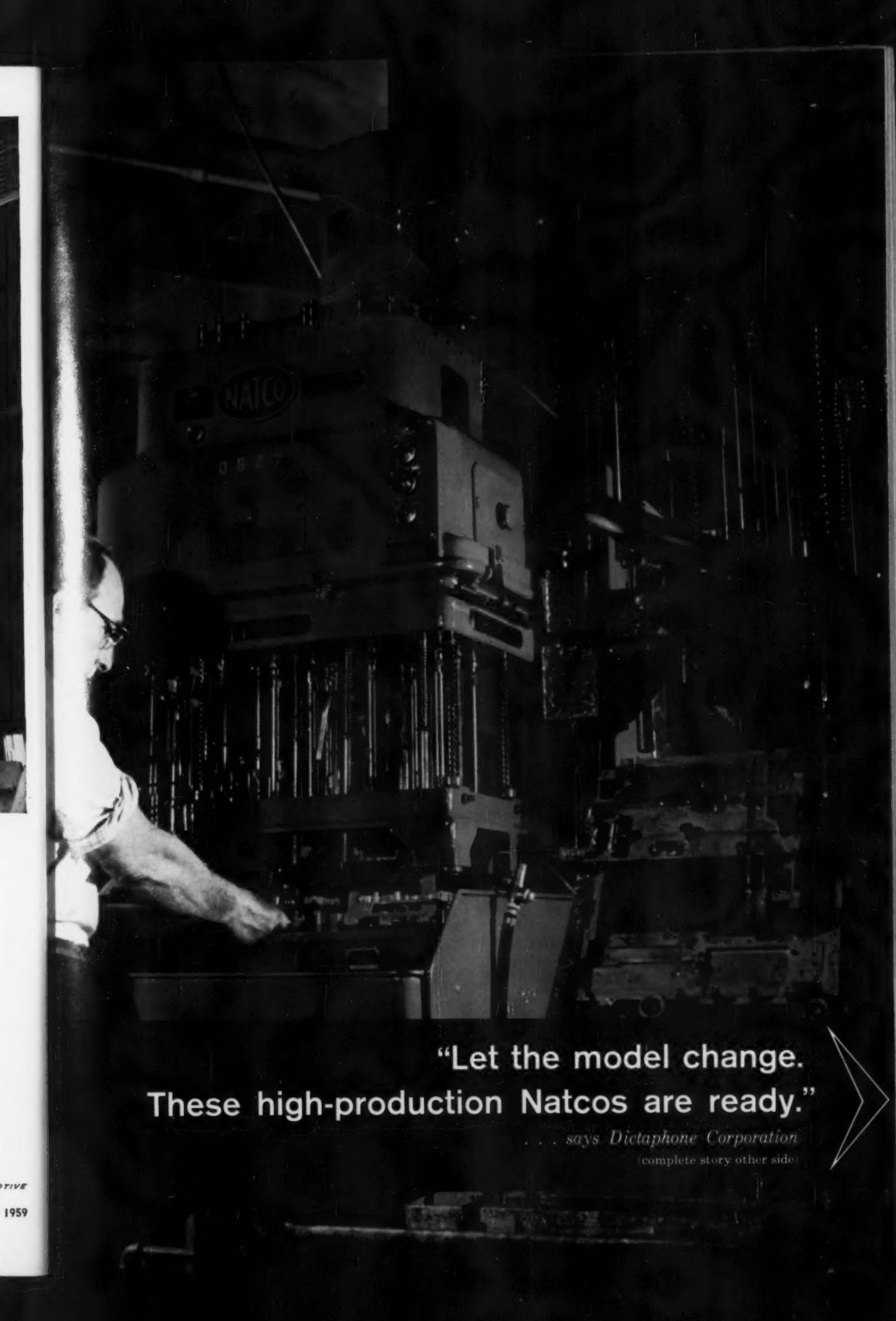
Your operators perform more efficiently, too, because there's far less fatigue. The operator stops the crane with the easy touch of a toe on a button while his heel rests comfortably on the floor. Several brakes can be operated from one pedal.

These power units can be added to your present Wagner Hydraulic System. Let your nearby Wagner Sales Engineer tell you how easy, fast, and economical such an installation can be. There are Wagner branches in 32 principal cities.

Wagner Electric Corporation
6403 Plymouth Ave., St. Louis 14, Missouri.

W159-4

SERVING 2 GREAT GROWTH INDUSTRIES... *ELECTRICAL... AUTOMOTIVE*



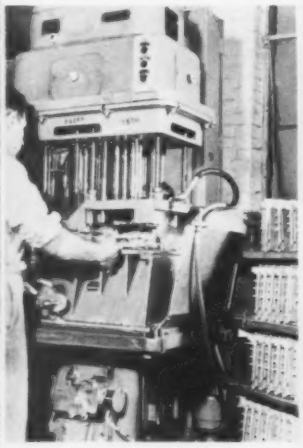
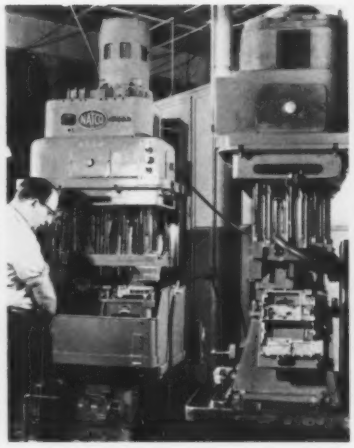
**"Let the model change.
These high-production Natcos are ready."**

. . . says Dictaphone Corporation

(complete story other side)

Five parts for the cost of one!

Fast changeover too!

These 7 standard Natcos do it for Dictaphone!

Costs toppled 81%, savings exceeded $1.00 per part when Dictaphone Corporation, Bridgeport, Conn., switched from gang drill production to this line of seven high-production H-6 Natcos. *Standards*, not specials. They quickly convert when models change; and replacement parts for old models can be run on the same line with minimum time for changeover.

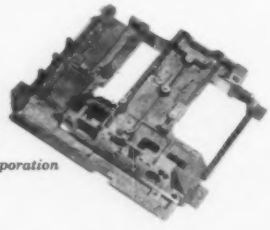
Dictaphone's part is a magnesium main frame for its Time-Master dictating machine. It calls for drilling 97 holes and performing 150 secondary operations—reaming, tapping, counterboring and countersinking on most of them. The seven multi-spindle Natcos handle all but 16 of these operations.

Besides increasing production 81 per cent, the seven Natcos eliminate skipped and creeping holes, and maintain close tolerances. Natco tooling locates the magnesium parts without warping stresses.

On the Natco H-6, the slip plate is the key to flexibility. For example, Dictaphone transferred four Natcos from other assignments, simply by fitting them with new slip spindle plates and, of course, new fixtures. Three new Natcos filled out the line.

Natco H-6 and other multi-spindle drilling machines are available in models from 1 hp with 10 spindles to 50 hp with up to 72 spindles. Write today for complete details or see your Natco representative.

Under the cover of
the Time-Master *,
. . . profits in 97 holes.



*Registered trademark of Dictaphone Corporation

NATCO

NATIONAL AUTOMATIC TOOL COMPANY, INC., RICHMOND, IND.

World's biggest dump truck—made with USS "T-1" Steel—hauls 165-ton loads at 35 mph. Western Contracting Corp. conceived the truck, had it designed by Charles W. Jones, engineering firm of Los Angeles. Fabricators of box and frame: Eaton Metal Products Corp., Omaha.

World's biggest truck made 25% lighter with USS "T-1" Steel

Your first impulse is to dive for the ditch when you see this mastodon of trucks roaring down the haul road at Oahe Dam near Pierre, South Dakota. But if you're an equipment builder, you will wonder how they got the tremendous strength necessary without adding too much dead weight.

That was the problem faced by the Western Contracting Corporation of Sioux City, Iowa when they decided to build the biggest possible dump truck. It is an 18-wheel, 750-hp semi-trailer that is currently hauling a payload of 110 yards or 165 tons. The truck is 55 feet long, 16 feet wide and 14 feet high.

25% lighter. To get this high capacity with the least weight, they built the box and frame of USS "T-1" Constructional Alloy Steel. "T-1" Steel had a minimum yield strength of 90,000 psi but is now available at 100,000 psi. Western estimated it saved 12½ tons in dead weight or 25% of the trailer's weight.

Good fabricating properties. Because USS "T-1" Steel can be readily formed and welded, all members could be built up from plates. Reinforcing for the box was formed into channels through which exhaust gases are piped to keep the load from freezing in cold weather.

High resistance to impact abrasion. Dumping a 165-ton load in a few seconds causes terrific abrasion. "T-1" Steel is noted for its ability to take this kind of punishment, and it gives much longer service than ordinary steel.

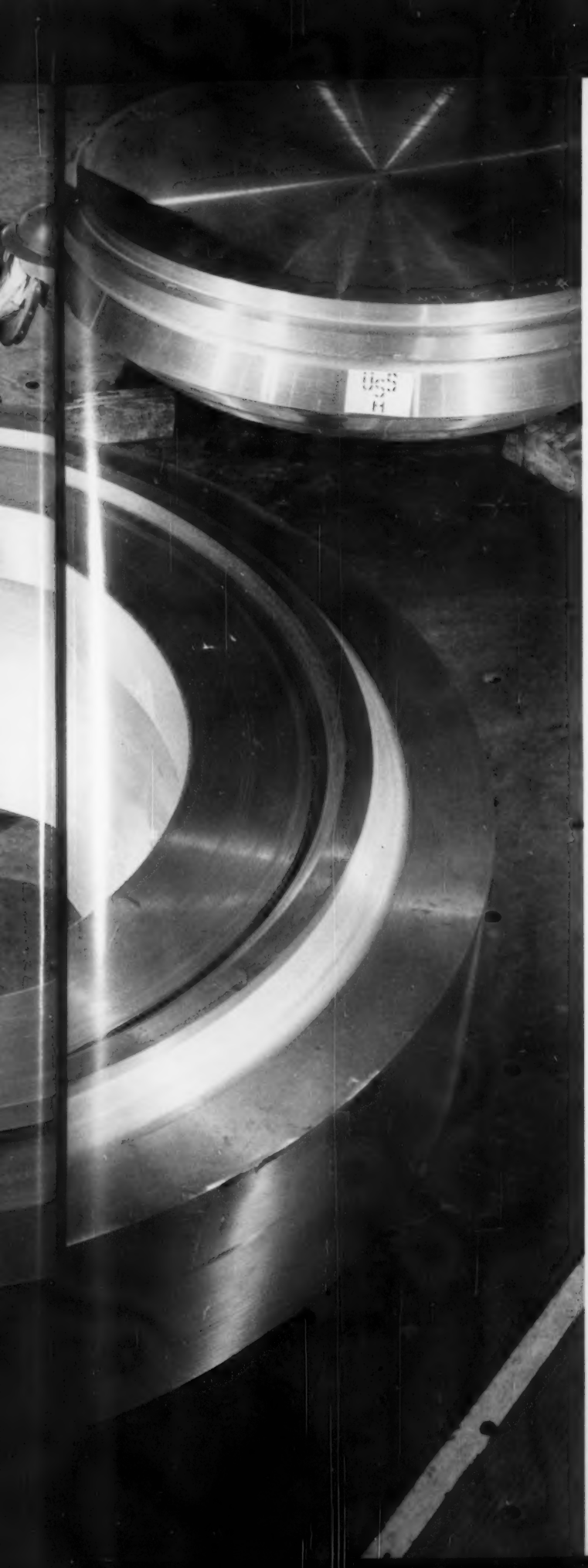
In addition to 100,000 psi "T-1" Steel, we produce three brands of USS High Strength Steel in the 50,000 psi Yield Point range—MAN-TEN, COR-TEN and TRI-TEN. Each has its own characteristics that make it ideal for certain applications in construction and mining equipment. Find out how these steels can reduce weight, increase strength, and lower your operating costs. Address United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pennsylvania.

USS, "T-1," COR-TEN, MAN-TEN, and TRI-TEN are registered trademarks

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

United States Steel

USS



First atomic aircraft carrier uses USS Quality Steel Forgings

The Navy is now building the ENTERPRISE, the world's first nuclear-powered aircraft carrier. You won't hear much about it because of security, but if you had visited U. S. Steel's Homestead plant a few weeks ago, you could have inspected two of the parts of the ENTERPRISE'S power system. You see them in the picture—a closure head flange and a top disc for one of her eight reactor vessels. They are USS Quality Forgings.

The top disc will be seated inside the flange and both parts will be welded to other sections to form a single, sealed reactor vessel. The top disc weighs 36,750 pounds and the flange weighs 74,000 pounds. In service, these parts must withstand high pressure and radioactivity. The steel must be of excellent quality.

Manufacture of these Ni-Cr-Mo alloy steel parts included forging, preliminary heat treating and preliminary machining. This was followed by quenching and tempering. Then came a battery of tests: ultrasonic inspection, tangential tensile tests, Charpy V notch impact tests, grain size tests, bend tests and magnetic particle inspection.

These are just two examples of the many forged flanges, discs, rings, heads, cylinders, and bored pipe that United States Steel has produced during the past few years for industrial and marine nuclear applications.

These two forgings have an especially critical job to perform, so they were made by top-skilled men using the finest equipment—the same men and equipment that make *every* USS Quality Forging. We will appreciate your inquiries or requests for our free 6-page booklet on USS Nuclear Forgings. Write to United States Steel, 525 William Penn Place, Pittsburgh 30, Pa. *USS is a registered trademark*

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel

USS

Here is one of a fleet of forty Type 430 Stainless Steel tank cars that transport nitric acid. Built in 1956 by General American Transportation Corporation, these tank cars are still in excellent condition.

Leading the pure life—in USS Stainless Steel

A manufacturer's *second* biggest disappointment is to have his product rejected because it was contaminated during shipment. The *biggest* disappointment comes when the customer buys his next order from someone else.

Manufacturers who ship or contain their products in Stainless Steel seldom worry about product purity. Many chemicals that eat away other metals have no effect on Stainless Steel. It keeps a smooth, dense surface that is easy to clean. No corrosion. No pits. No place for dirt to hide. And there's less danger of spoiling one batch with residue from another.

Because Stainless Steel is so strong, it can be used in thinner, lighter gages—reducing the overall weight of the container. But the real clincher is this: even though Stainless Steel costs more, there is no cheaper material in the long run. Specify USS Stainless Steel . . . through our nearest sales office or your local Steel Service Center.

USS is a registered trademark

United States Steel Corporation – Pittsburgh
American Steel & Wire – Cleveland
National Tube – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Steel Service Centers
United States Steel Export Company

USS **United States Steel**

expensive part thread-rolled and burnished... *with no spoilage*

Specifications required that threads be rolled and thread relief burnished after heat treat on this highly critical, highly stressed aircraft jet engine mounting (figure 1) made by Liston Grinding Co., Tonawanda, N. Y.

Both operations were performed between centers on the same LANHYROL Machine with the same work-holding fixture. The plastic deformation and cold working of the thread rolling process vastly improved the tensile strength and fatigue resistant properties of the part. The material was 4340 steel at a minimum hardness of 40 Rockwell "C" to assure a tensile strength of 180,000 to 200,000 PSI.

figure 1

Prior to the LANHYROL operations, each part contained many hours of manufacturing time. Because of this accumulated cost, it was essential that burnishing and rolling be accomplished with minimum scrap. Of the entire lot of parts rolled to date, not one has been spoiled in either rolling operation, including those used in setting up the machine.

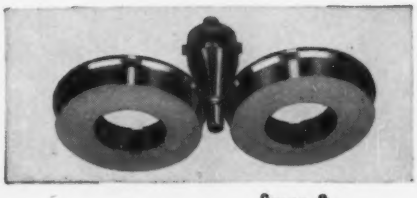


figure 2

The roll-burnishing operation (figures 2 & 3) preceded the threading operation and increased the fatigue resistant properties of the material by cold working plus reducing any stress-raising grinding marks. First, the surfaces were ground to a surface finish approximating 20 micro-inches before roll-burnishing. Then the two radii and the neck diameter were burnished to a 4/6 micro-inch finish using a 25,000-pound roll pressure. The dies were in contact with the workpiece, turning at 480 RPM, for 1.5 seconds.

After roll-burnishing, the 3/4" — 16 UNF — 1.03" long threads were rolled (figures 4 & 5) at a workpiece speed of 1320 RPM. The thread rolling dies were in contact with the workpiece for only .24 of a second. All threads were produced to near-perfect concentricity with a pitch diameter variation of less than .0005".

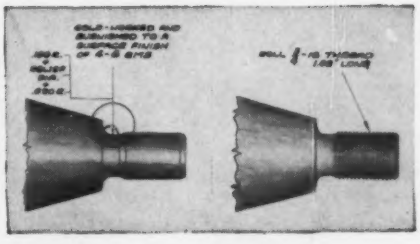


figure 3 figure 4

The LANHYROL Thread Rolling Machine produces strong, accurate threads of excellent finish by any one of four rolling methods—Thrufeed, Infeed, Continuous or Reciprocal. It will thread all diameters from "O" to 3", producing left and right hand threads of all types, including UNC, UNF, Acme, worm and many special forms. Ask for Bulletin E-60.

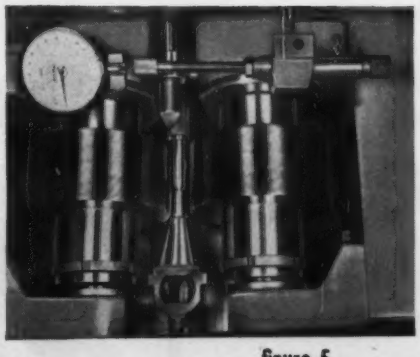


figure 5

LANDIS *Machine* COMPANY

WAYNESBORO • PENNSYLVANIA

527

Howard Beacham tripled wheel life,

Howard Beacham has been a Bay State Abrasive Engineer for fifteen years and his total experience is double that. He's worked on grinding problems that have involved every type of metal in jobs as tiny as miniature bearings and as big as the world's largest air compressors and steam turbines.

cut dressing frequency in half at New Process Gear

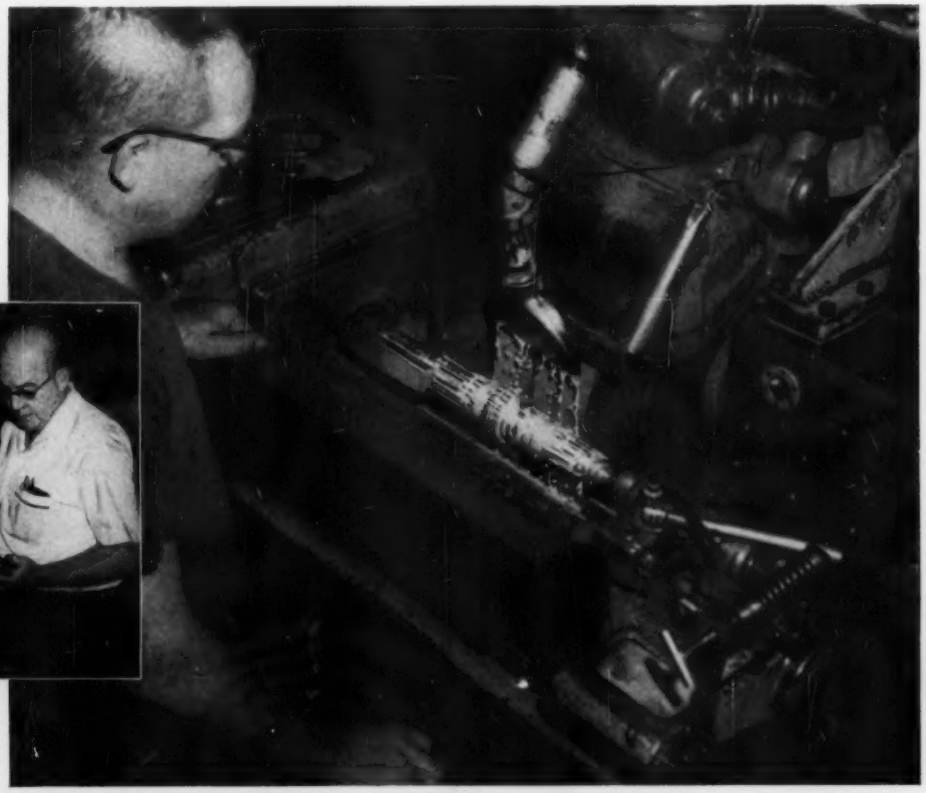
The closer you get to automation, the more it hurts to have production interrupted. That was the principal problem at Chrysler's New Process Gear Division where semi-automatic grinding of flats on truck transmission shafts was halted by wheel dressings every eleven pieces.

The three competitive wheels used in this simultaneous "cam grinding" operation wore down so fast they had to be replaced every week. And, on top of that, an alarming number of shafts were being cracked during the grinding operation.

Bay State's Howard Beacham was called in on the job. He specified a trio of Bay State wheels that produced really spectacular results.

Production jumped to twenty-five perfect shafts per dressing and wheel life went up to three full weeks. Finish was excellent, too.

Why not talk to your own Bay State representative next time you have a grinding problem? Like Howard Beacham he's a trained specialist. *Better grinding at lower cost . . . that is his business.*



Operator Henry Kotas runs grinder equipped with one 24 x 1-21/32 x 12 and two 24 x 1-3/4 x 12 Bay State wheels. The three wheels simultaneously grind flats on main shaft for 5-speed truck transmission.

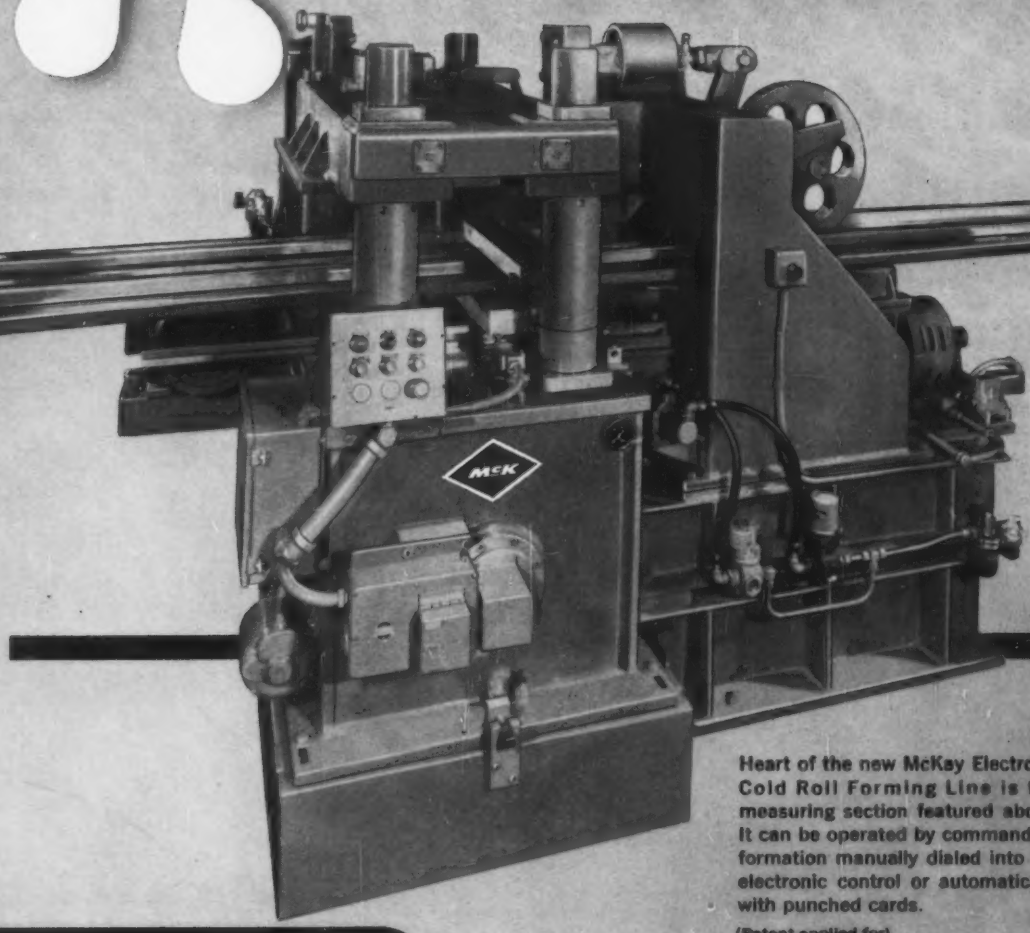
(*Above*) Manufacturing Engineer Wiley Bell and Plant Superintendent Nelson Fisk examine finished truck transmission shaft.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVES

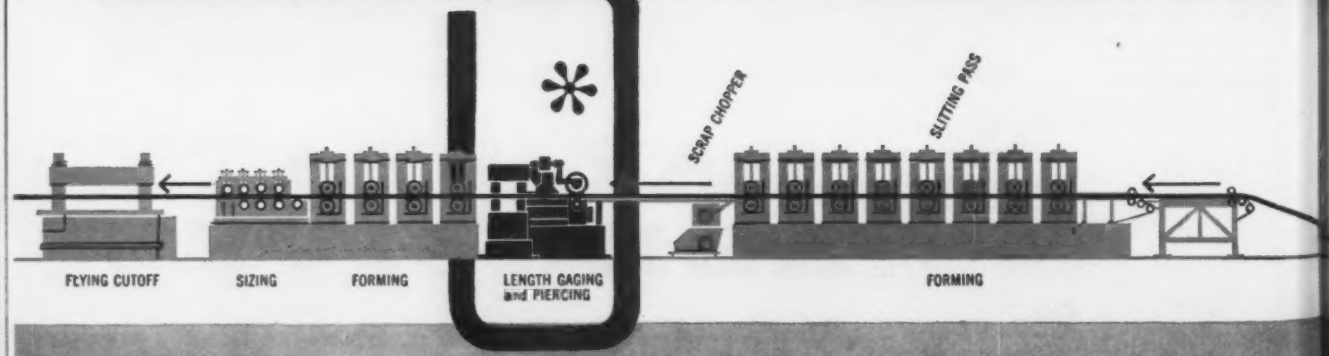
Bay State Abrasive Products Co., Westboro, Massachusetts.
In Canada: Bay State Abrasive Products Co., (Canada) Ltd., Brantford, Ontario.
Branch Offices: Bristol, Conn., Chicago, Cleveland, Detroit, Pittsburgh. *Distributors:* All principal cities.

10,001 d



Heart of the new McKay Electronic Cold Roll Forming Line is the measuring section featured above. It can be operated by command information manually dialed into the electronic control or automatically with punched cards.

(Patent applied for)



The line illustrated above was recently purchased by a large building products manufacturer for high speed production of roof and floor deck.

different lengths...

...WITHOUT A MANUAL ADJUSTMENT

McKAY'S ELECTRONIC LENGTH GAGE has a memory permitting instantaneous changes in cut lengths and scheduled quantities as well as precise control of notch and punch spacing on each length.

A transistorized electronic control reads and stores information from punched cards and utilizes an electronic counter to trigger a punching and notching press at precise intervals as commanded by the coded data on the punched cards.

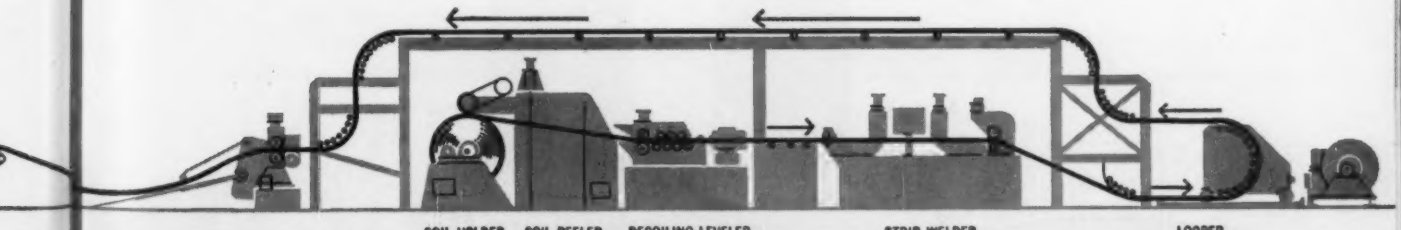
Now! the planning department can schedule the output of a forming or cut-up line without waiting to group identical lengths.

Now! down time previously required for manual length gage adjustment is converted to productive time.

Now! in addition to length control, precise spacing of notches and punches can be controlled and changed by commands received from coded information on the standard data processing card.

BE SURE TO GET THE FULL STORY ON McKAY'S ELECTRONIC GAGE FOR YOUR PRODUCTION LINES.

Call or write the McKay Machine Company, Youngstown 10, Ohio.



McKAY MCK MACHINE

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STEEL PLATES
made to many specifications

This giant is the Image of CF&I, reflecting CF&I's experience and versatility as one of the nation's leading primary producers of quality steels and steel products for industry.

He represents the quality controls that CF&I exercises during every step of manufacture—from ore to finished product—in the output of Claymont Steel Plates:

...**Carbon Steel Plates**—in standard ASTM and AISI specifications and special plates for special applications.

...**Alloy Steel Plates**—regularly produced by Claymont to ASTM specifications: A-387 • A-204 • A-202 • A-203 • A-225 A-302 • A-353 • A-357; also AISI specifications: 4140 • 4130. Inquiries are invited on other specifications to meet your requirements.

...**Stainless-Clad Steel Plates**—in AISI designations: 304 304L • 316 • 316L • 316Cb • 321 • 347 • 405 • 410 • 430—as well as in other specifications to meet individual requirements. Stainless cladding: from 5% to 50% of total plate thickness. Cladding inseparably bonded to carbon steel backing.

...**CF&I Lectro-Clad Nickel Plated Steel Plates**—a thick layer of metallic nickel, more than 99% pure, electro-deposited in thicknesses up to 30 mils onto carbon steel plate... provides positive protection against contamination and discoloration, at less cost than solid nickel.

...**Clay-Loy High Strength Low Alloy Steel Plates**—complies with ASTM specification: A-242. Ideal for structural and equipment applications because Clay-Loy Plates are 50% stronger than carbon steel plates of the same thickness, thus permitting weight savings up to 25% without sacrificing strength.

For complete information and order service, contact the CF&I warehouse or district sales office nearest you.

CF&I-CLAYMONT PRODUCTS: Carbon Steel Plates • Alloy Steel Plates • CF&I Lectro-Clad Nickel Plated Steel Plates • Clay-Loy High Strength Low Alloy Steel Plates • Flanged and Dished Heads • Manhole Fittings and Covers • Fabricated Steel Plate Products • Large Diameter API Pipe

Claymont Steel Products

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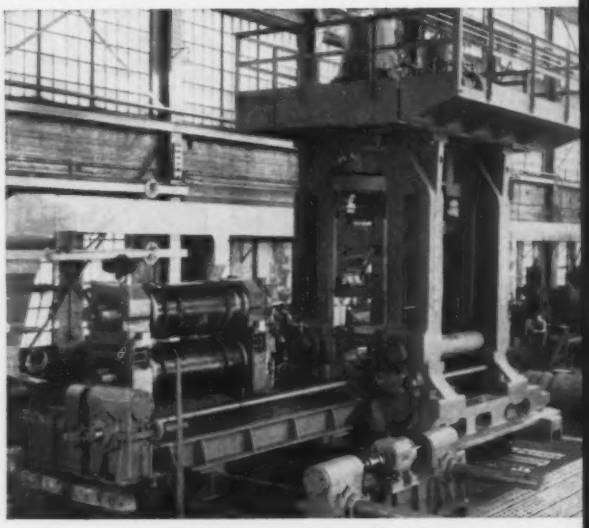
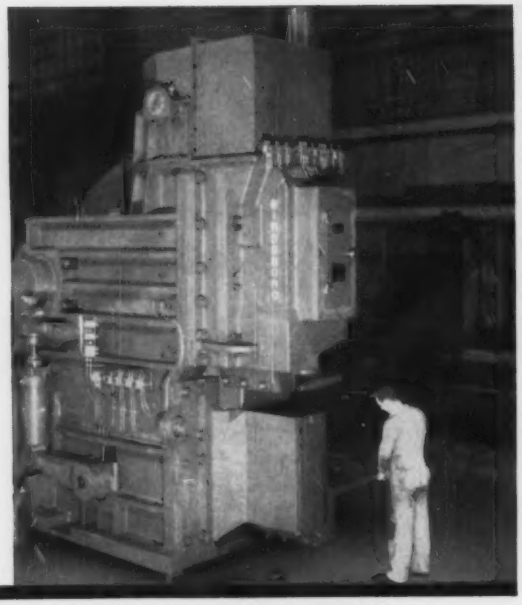
For the tough competition ahead,
you'll find your key to mill profits
under this name.....

BIRDSBORO



Blooming Mills by BIRDSBORO



Shears by BIRDSBORO

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•Whatever your particular profitability key unit is . . . It's sure to be designed, built, and worth more to your company, if it's produced by Birdsboro. Nowhere else can you get the value of more experience and skill . . . more background in working on outstanding industrial achievements.

From one piece of equipment to a complete mill, Birdsboro's custom-designing of special machinery will work on the profit side of the ledger for you well into the future. *Sales Department, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

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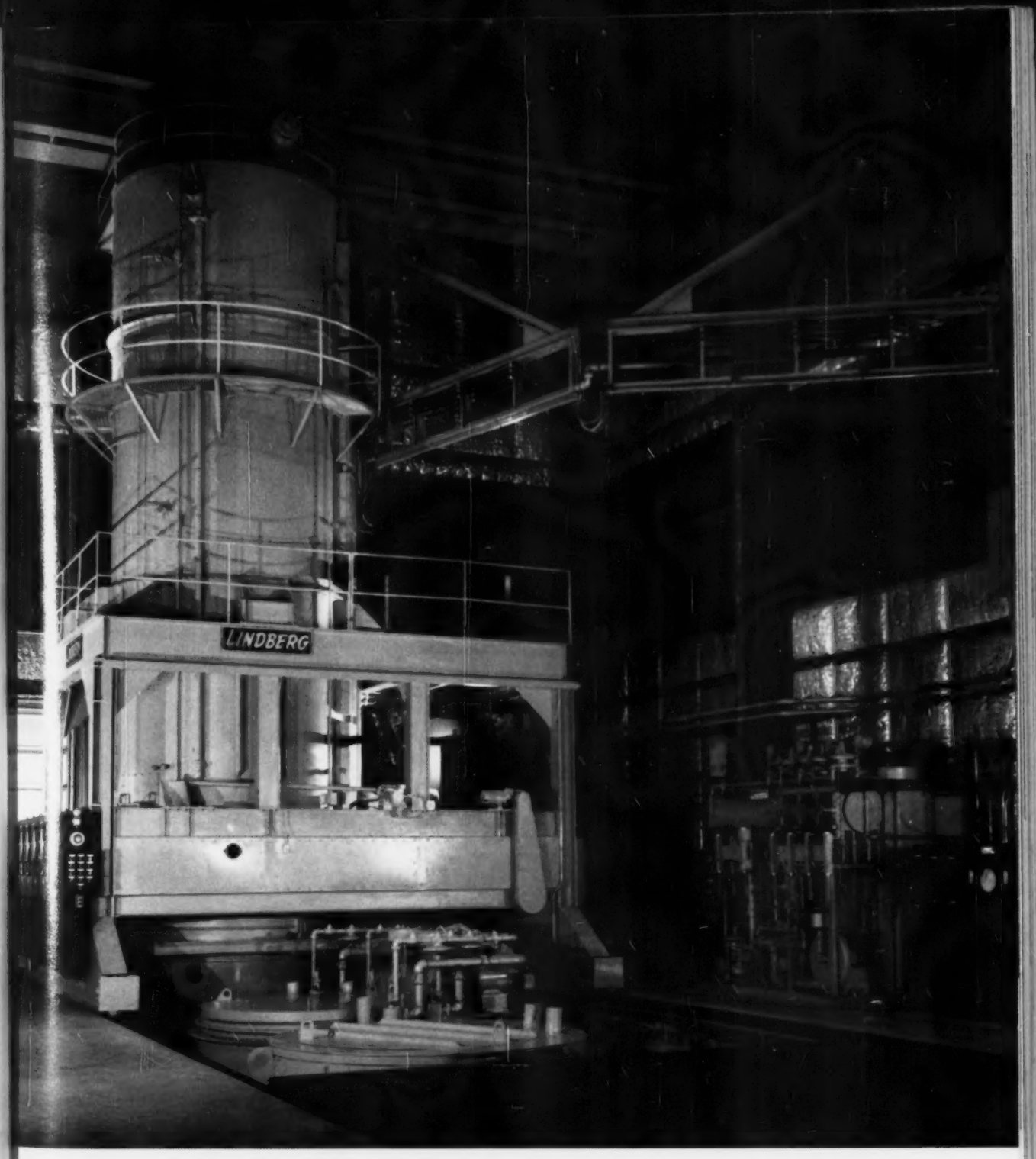
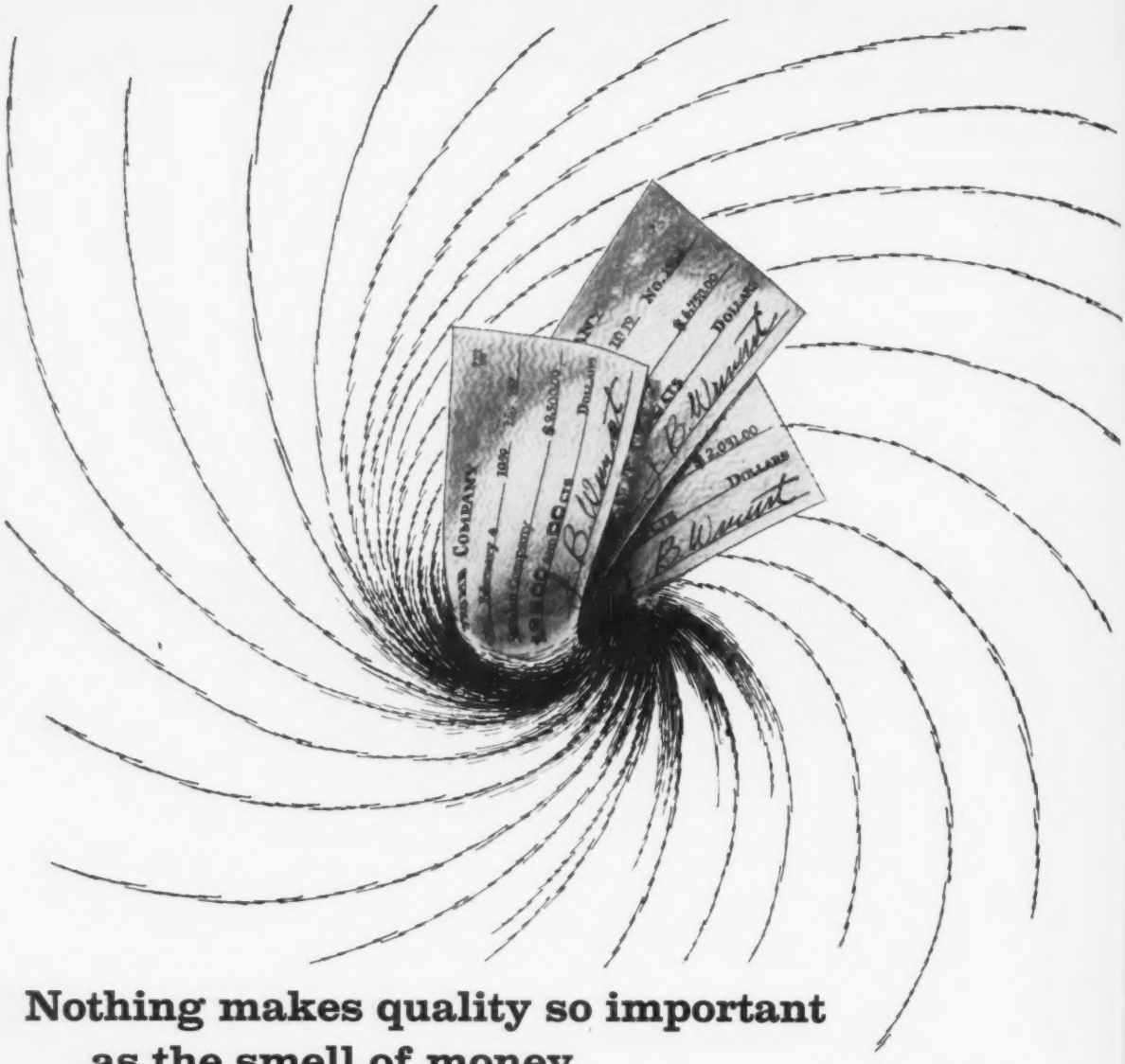
STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



When the urgent demands of our missile program required heat treating equipment far beyond conventional standards, Lindberg filled the need with this remarkable furnace installation. In a few months, this gantry-type, bottom quench, atmosphere furnace and its attendant facilities were designed, installed and put into operation at Lindberg Steel Treating Company, Melrose Park, Illinois, by Lindberg engineers and technicians. This accomplishment was no sudden inspiration, but was made possible by Lindberg's long years of experience in creating industrial heating equipment of every kind . . . heat treating, melting, brazing and enameling furnaces, high frequency units, ceramic kilns, pilot plant and laboratory furnaces . . . either electric or fuel fired. Whenever a product needs heat you can count on Lindberg to know how best to apply it. See your local Lindberg Field Engineer or write us direct. Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill.

LINDBERG heat for industry



Nothing makes quality so important as the smell of money

Nothing makes quality so important as the smell of money. Especially if the money comes out of your pocket.

Such is the case when you buy fasteners.

This is true because assembly costs are 50-75% of manufacturing charges. Direct labor charges are 81% of that figure while fasteners account for only 19%. Your biggest opportunities for profit improvement, then, lie in reducing the direct labor costs of assembly.

So the saving of a few cents a thousand on the cost of fasteners isn't so attractive when the failures show up. A unit pulled from the production line because of a stripped thread; rejects; more frequent inspections . . . all these eat up your profits.

We believe that quality is what smart industrial buyers really want. And we back up our belief with continuous research to find fasteners that will perform better, cost less, last longer and be easier to use.

It is this belief in quality which underlies our Profit Improvement Program for you — because nothing improves your profits like a quality product that helps you cut your costs.

Profit Improvement Program

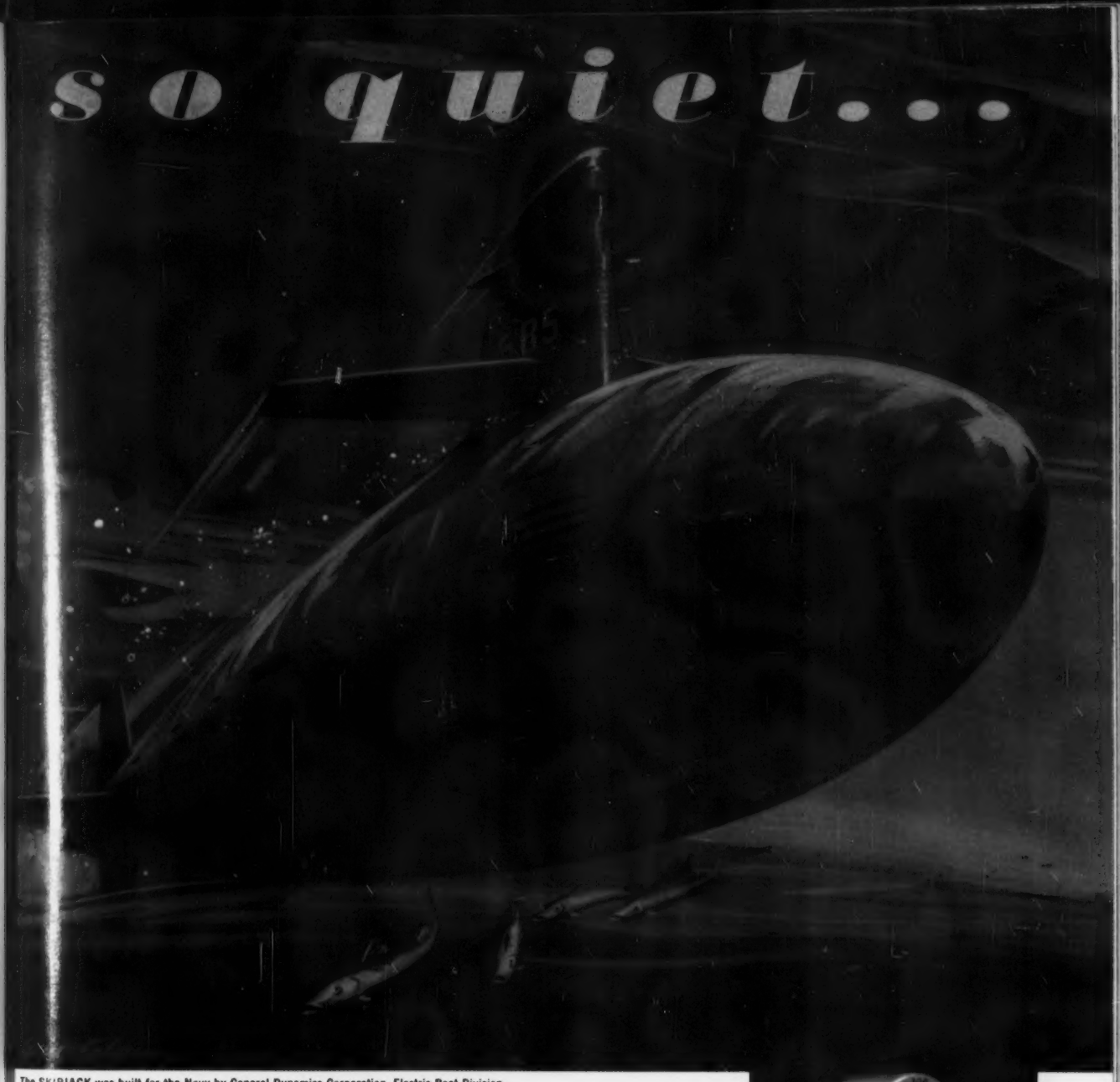
In every phase of modern fastening and assembling — new products, new applications, new packaging, quality control — American's Profit Improvement Program spells more profit for you. Ask your American Screw Company salesman about these ideas you will find profitable.

The Biggest News in Fasteners comes from

American
SCREW COMPANY

Willimantic, Conn. • Detroit, Mich. • Chicago, Ill.

so quiet...



The SKIPJACK was built for the Navy by General Dynamics Corporation, Electric Boat Division.

Newest and fastest of the Navy's fabulous nuclear submarines is the SKIPJACK, designed to carry out underwater missions in utmost silence. That is why the hushed quietness of Hoover quality ball bearings makes them the first choice for critical applications. Precision-made with super-smooth *Hoover Honed* raceways and perfectly matched sets of *Micro-Velvet* balls, Hoover ball bearings contribute to the quiet, enduring performance of a wide range of products.

Hoover Honed and *Micro-Velvet* are Hoover Trademarks.

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BALL AND BEARING COMPANY

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Sales Offices and Warehouses: 2020 South Figueroa, Los Angeles 7, California | 290 Lodi Street, Hackensack, New Jersey

Hoover Ball and Bearing Company
5400 South State Road, Ann Arbor, Michigan

Please send new Bulletin 110 which describes Hoover's full line of quality deep-groove ball bearings.

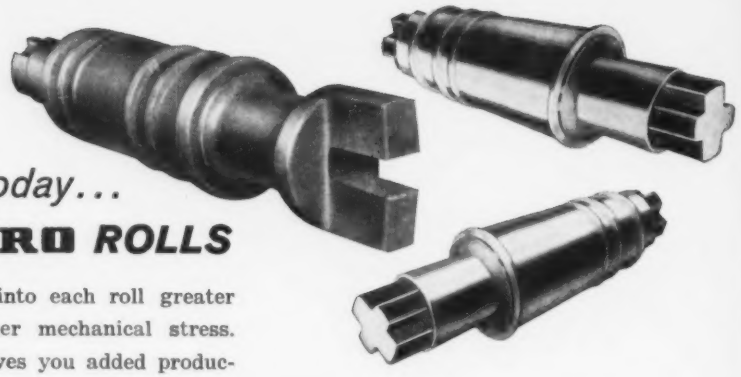
Name_____

Title_____

Company_____

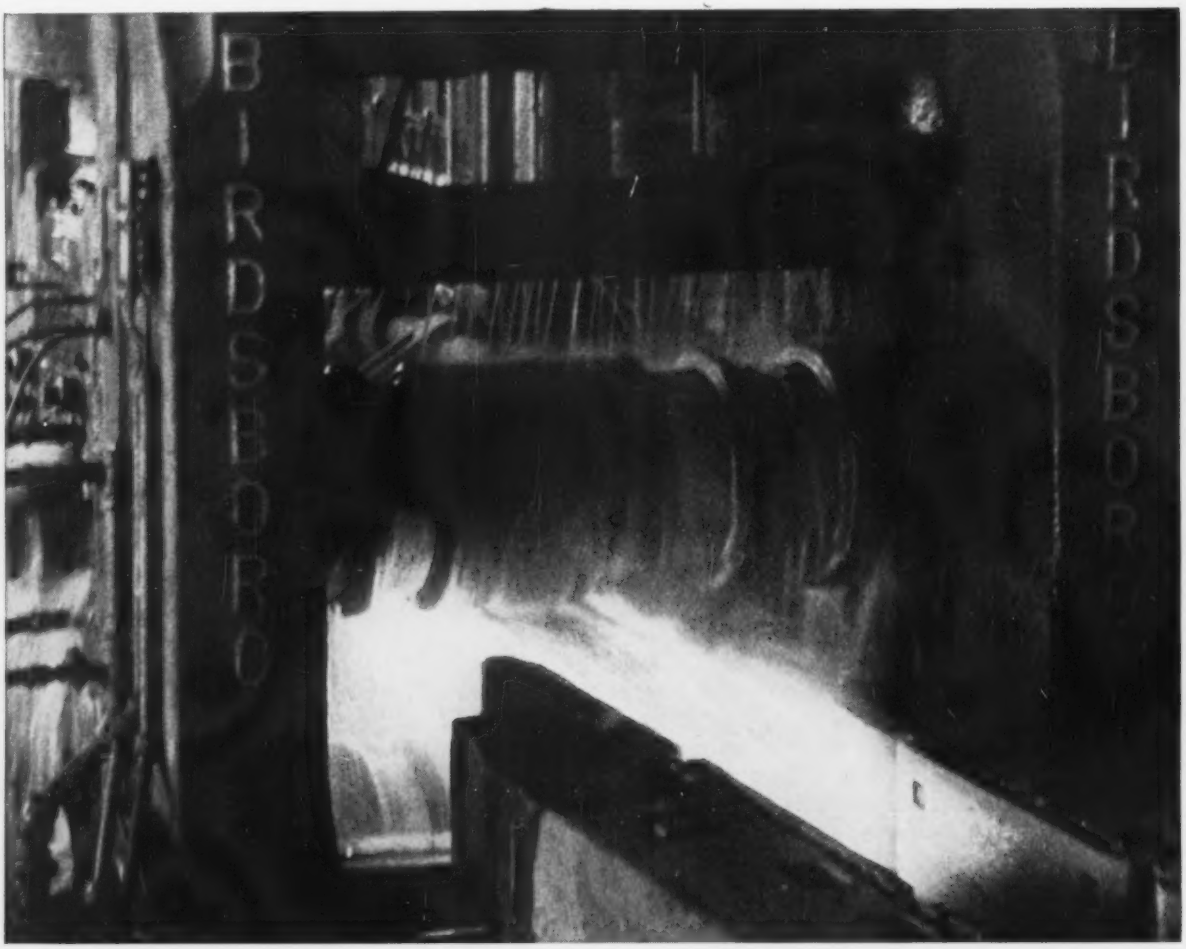
Address_____

City_____ Zone_____ State_____



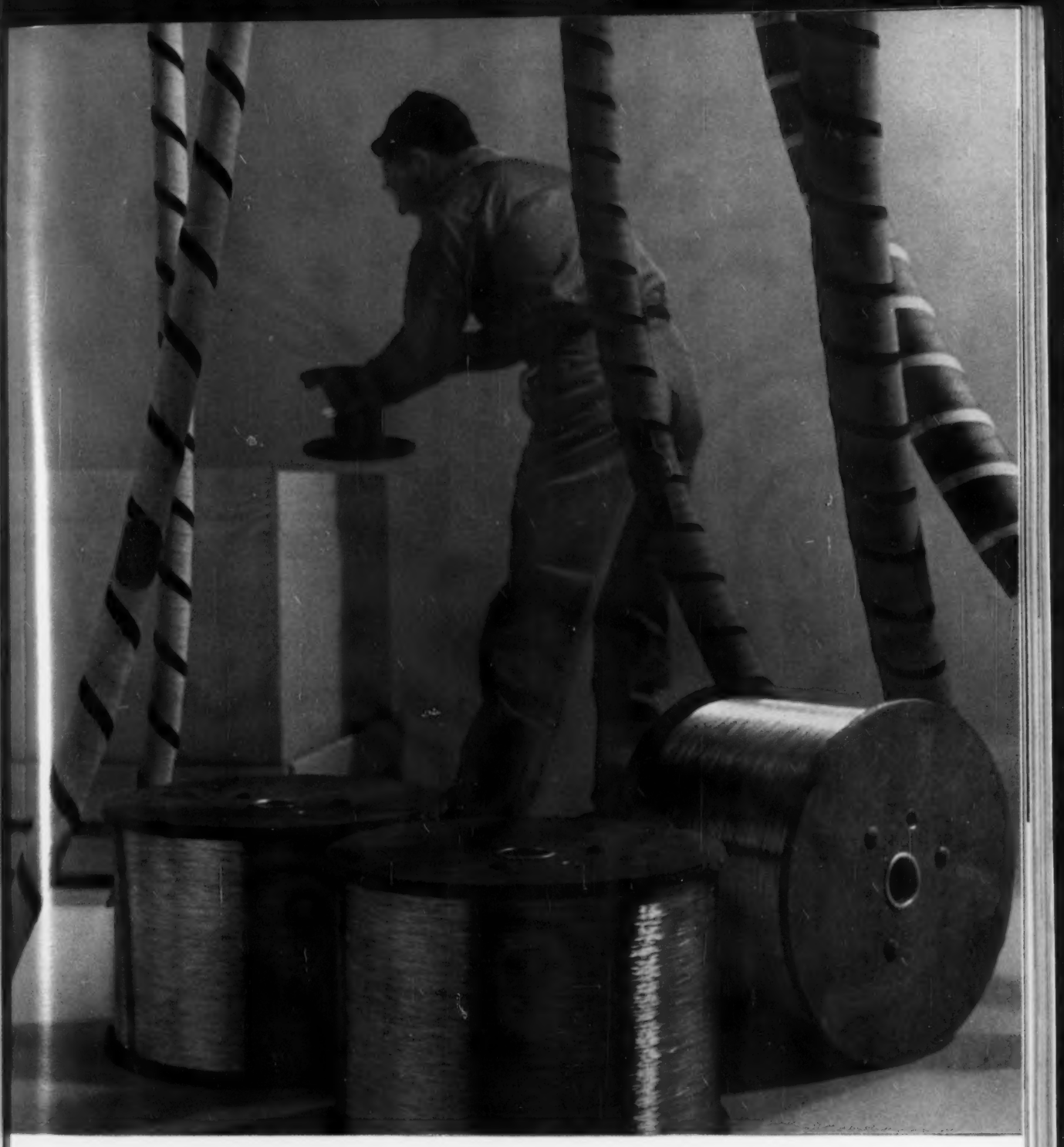
For the profit-making productivity you need today... specify **BIRDSBORO** *ROLLS*

● BIRDSBORO's roll engineers design into each roll greater sub-surface strength to withstand higher mechanical stress. Increased resistance to thermal shock gives you added production protection, longer service between dressings and higher output per roll. Mills such as yours are gaining these production benefits every day. Contact your Birdsboro representative for complete information. *Sales Department, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.



BIRDSBORO
STEEL FOUNDRY AND MACHINE CO.

STEEL MILL MACHINERY • HYDRAULIC PRESSES • CRUSHING MACHINERY • SPECIAL MACHINERY • STEEL CASTINGS • Weldments "CAST-WELD" Design • ROLLS: Steel, Alloy Iron, Alloy Steel



Roebling Hose Reinforcing Wire... The best things come in no-charge packages

When you buy Roebling Hose Reinforcing Wire it is delivered to you on no-charge spools that mean savings to you.

This modern method of packaging does away completely with deposits and the bookkeeping involved; it contributes, too, to lower freight costs. Thus, you avail yourself of a precision-made and quality controlled product, without any handling, shipping and inventory inconveniences.

Roebling Hose Reinforcing Wire, used for braiding reinforcement, is produced in a complete range of sizes. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

Roebling... Your Product is Better for it

ROEBLING

Branch Offices in Principal Cities
Subsidiary of The Colorado Fuel and Iron Corporation

Storage bins into which sand ingredients are conveyed by a Fuller-Kinyon Conveying System. Note the pipe-line system which permits ingredients to be conveyed into their respective bins.

One of two Fuller-Kinyon Pumps which convey sand ingredients to storage bins and from bins to mixers.

FULLER-KINYON CONVEYING SYSTEM HANDLES THREE DIFFERENT MATERIALS EFFICIENTLY, WITHOUT WASTE

To reduce costs and speed up handling of foundry sand ingredients with minimum waste, General Steel Castings Corporation, Granite City, Illinois, installed a Fuller-Kinyon Conveying System.

Here's what it does for them—

The system unloads corn flour, silica flour and bentonite from hopper bottom cars by means of Fuller-Kinyon Pumps which convey these materials through pipe lines to a number of storage bins. The flexibility of the system makes it possible to unload cars in a fraction of the time that would be required manually, *and*, waste due to spillage is eliminated. Two pumps used in the operation can be moved on narrow gage tracks for spotting under cars or bins. One pump is used mainly for unloading and delivery to storage—the other for delivery from storage to supply bins above the mixers. However, it is possible to unload cars and reclaim from storage simultaneously. Where bins are located so that they cannot discharge directly to a pump, an F-H Airslide® conveys from bins to the pump.

Prior to the Fuller installation, material was received in bags and manually unloaded, stored and transported to the mixers. It figures—*costs were much higher.* Now, waste has been eliminated! Another important feature—the company has realized extra savings by purchasing materials in bulk.

Fuller air-conveying systems are in operation in hundreds of plants throughout industry, cutting costs and increasing profits, day in and day out. The next time you have a materials-handling problem, why not get in touch with Fuller . . . chances are you will also profit.

FULLER COMPANY GENERAL AMERICAN TRANSPORTATION CORPORATION

Fuller

. . . . pioneers in harnessing AIR

FULLER COMPANY P-168 4038

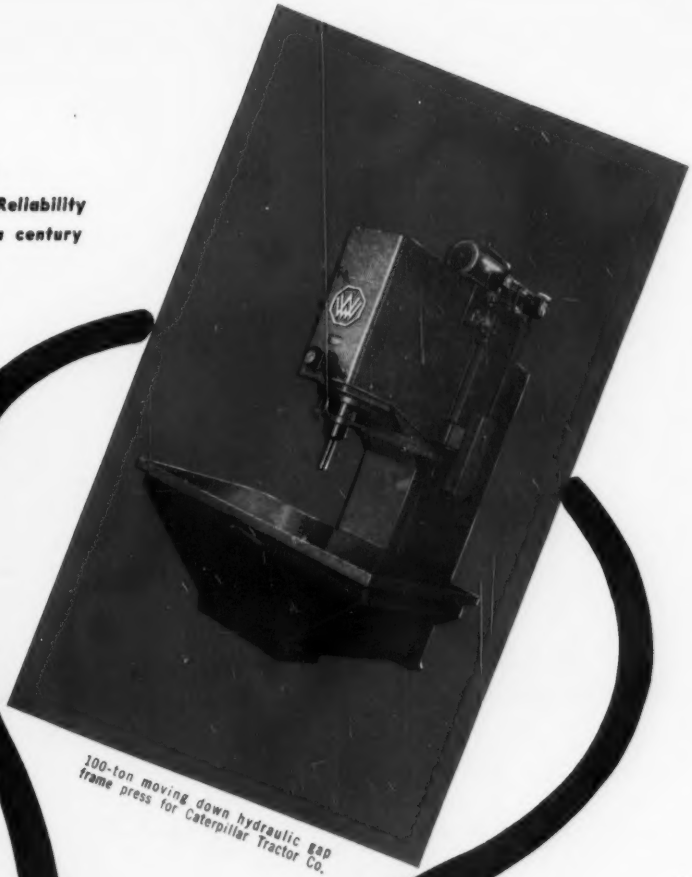
122 Bridge St., Catasauqua, Pa.

SUBSIDIARY OF GENERAL AMERICAN TRANSPORTATION CORPORATION

Birmingham • Chicago • Kansas City • Los Angeles • San Francisco • Seattle

THE IRO

the measure of
Performance Reliability
for more than a century



100-ton moving down hydraulic gap frame press for Caterpillar Tractor Co.

Design simplicity, positive and sensitive controls, trouble-free operation —

WILLIAMS-WHITE
GAP FRAME PRESSES

Williams-White gap frame presses are bread-and-butter equipment in scores of plants. Production men like their versatility, speed, dependability and economy. Standard sizes, 25, 50, 75, 100, 150 and 200 tons, or built to fit your special requirements as to capacities, opening speeds, daylight, stroke, throat and table dimensions. *Write for Bulletin No. 78.*

106th year

WILLIAMS-WHITE & CO • MOLINE, ILLINOIS

When you buy a machine you buy creative engineering skills and craftsmanship. Among your chief considerations should be the record and integrity of the maker.

BULLDOZERS PRESSES SHEARS BENDERS PUNCHES HAMMERS

SALES AGENTS: Portland, Ore.: Allied Northwest Machine Tool Corp.; **Los Angeles:** Engen Industrial Co.; **Philadelphia:** Edward A. Lynch Machinery Co.; **Milwaukee:** Pagel Machinery Co.; **Seattle:** Perine Machinery & Supply Co., Inc.; **Chicago:** Polhemus-Miller Co.; **Pittsburgh:** Frank Ryman's Sons; **Cincinnati, Columbus** and **Dayton:** Seifreat-Elstad Machinery Co.; **St. Louis, Kansas City** and **Tulsa:** Robert R. Stephens Machinery Co.; **Buffalo:** H. D. Thwaatt Co.

There's just One Rule at Bristol Brass...

To make every pound of strip, rod and wire the way we would want it, if we were buying it

Bristol-Fashion
means Brass at its best

THE BRISTOL BRASS CORPORATION • SINCE 1850, MAKERS OF BRASS STRIP, ROD AND WIRE IN BRISTOL, CONNECTICUT

Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

METALLURGICAL COMPETENCE: DO YOUR SPECIALTY STEEL SUPPLIERS HAVE IT?

How much confidence do you have in your supplier of specialty steels?

Here's why we ask. We've won over a number of new specialty steel customers in recent months because of our ability and desire to provide top metallurgical assistance. It's paid off for our customers in a number of ways: less rejects, less scrap loss and fewer specification revisions.

Our size of operation is an asset, too. Enables us to produce an end-product—AMBALLOY—uniform in quality, workmanship, and cleanliness. Amballoy enables users to restrict their necessary chemistries to a minimum. Proper heat treating economically matches metal to specs for those ultra-critical applications.

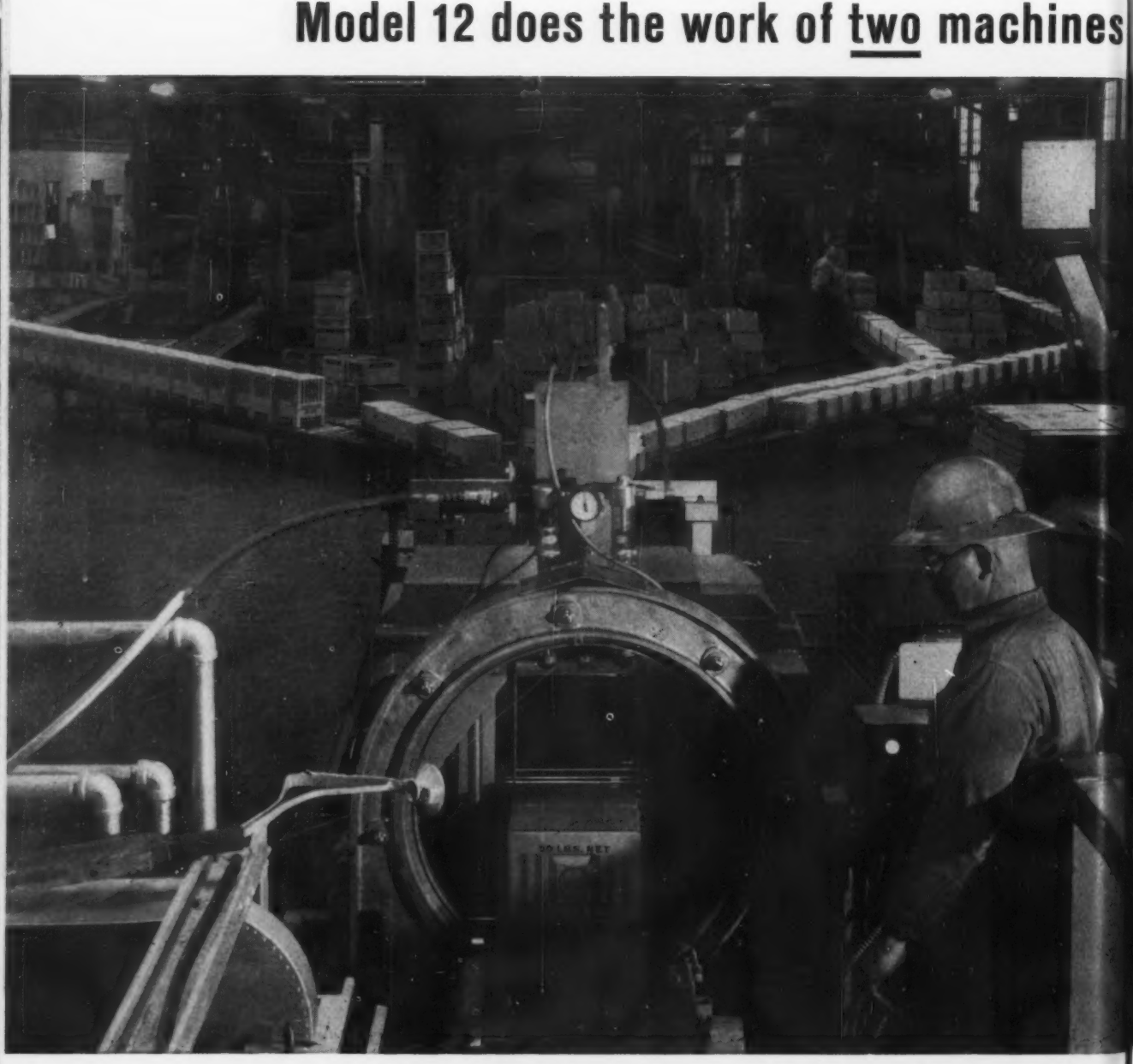
You can count on our metallurgical competence when you desire help with your material selection problems. If your confidence is shaken in your present supplier, contact us: A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

—personalized quality steels from a technically competent source

A. M. BYERS COMPANY

Another example of USS **COMPLETE STE**

Model 12 does the work of two machines —cu



Lightens your work —In the packaging operation shown here, one Model 12 USS Strapping Machine replaced two machines which were formerly needed to handle a wide variety of box sizes. The manufacturer reports, "Adjusting the strapping machine for different-sized cartons is now a matter of two or three seconds versus two or three minutes to adjust the previous machines. Where the old system was capable of binding 2,400 cartons per day, the new machine handles 3,000 cartons daily." Model 12 is fully automatic and ties packages from as small as 2 "x 8" up to 22" x 26", making 24 ties per minute.

U. S. Steel Supply
Division of
United States Steel

USS

USS Steel Strapping formerly
Gerrard Steel Strapping

STRAPPING **STRAPPING TOOLS**

Brighter
used by
strappin
"The big
costs— 4
pound ca
will bind
which co
experienc
high as
Strappin

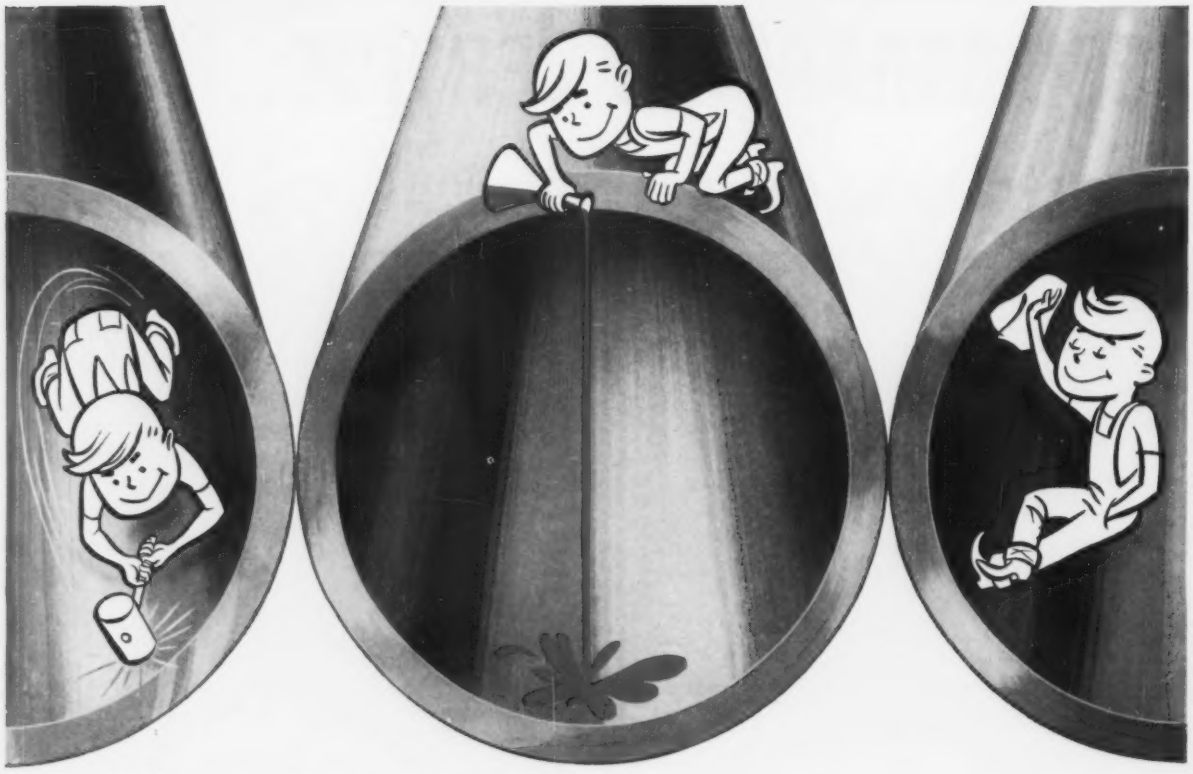
STEEL STRAPPING SERVICE

—cuts strapping costs in half

Brightens your profits—USS Round Steel Strapping used by the Model 12 offers a considerable saving in strapping costs. In this regard, the manufacturer says, "The biggest savings we have experienced is in material costs— 48% savings on 100-pound cartons and 45% on 50-pound cartons. A pound of round steel strapping (96 feet) will bind more boxes than a pound of flat steel strapping which contains 52.4 feet." Other manufacturers have experienced similar reductions in material costs, some as high as 50%, when they switched to USS Round Steel Strapping. *USS is a registered trademark*

Widens your potential—In many operations, the installation of the Model 12 machine has the effect of breaking a bottleneck. Faster tying permits increased production—more units shipped per man-hour. Why not consult a USS Steel Strapping Specialist about the application of Model 12 to your production line? Our Strapping Specialists are thoroughly familiar with industrial packaging problems and production line techniques. They have a wealth of experience to apply to your problems, and are not prejudiced in reaching the best solution. They can offer you either round or flat steel strapping as well as hand-operated, semi-automatic and automatic tying machines. Write for a free copy of our Sweet's Catalog insert for further information. U. S. Steel Supply Division, United States Steel, 208 South LaSalle Street, Chicago 4, Illinois.

TECHNICAL ASSISTANCE



The smoother surface of
CONTOUR-WELDED* STAINLESS TUBING
gives it greater resistance to corrosion

Recent tests prove: (1) *Contour-welded* tubing is smoother than any other tubing, and (2) this extra smoothness provides greater resistance to corrosion.

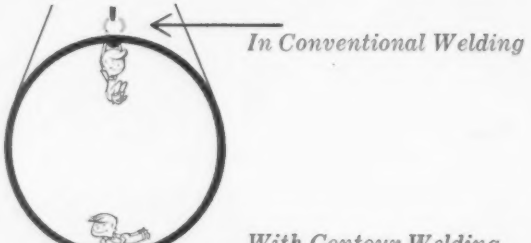
Here's how TRENTWELD® tubing, made by the exclusive *Contour-Weld* process, compares with other full-finished tubing:

- It's smoother than seamless because it's formed from uniformly rolled strip steel, whereas seamless is extruded from a billet.
- It's smoother than other welded tubing because the *Contour-Weld* process, patented by Trent, virtually eliminates the weld bead.

Other tests prove this smoother surface provides *increased resistance to corrosion* — because there are fewer focal points for corrosive attack. Not only that, the smoother surface ensures *longer fatigue life* and *less product incrustation.*

But get full details. Our free 48-page *"Trentweld* Manual" gives complete data on *Contour-Welded* tubing in sizes from ⅛" to 40" O.D., in stainless and high alloy steels, titanium, zirconium, zircalloy and Hastelloy.† Write: Trent Tube Company, Box 2518, Pittsburgh, Pa.

†Trademark Haynes Stellite Co.



In **CONVENTIONAL WELDING** of tubes, gravity pulls the molten metal down to form a bead that is difficult to remove by cold working. And cold working may lead to undercuts, focal points for fatigue cracks and corrosive attacks. Cleaning becomes difficult.

*With **CONTOUR-WELDING** the tube is welded at the bottom. Gravity still pulls the molten metal down inside the tube, but now the weld area corresponds to the contour of the tube. There's virtually no weld bulge on the inside surface. And even on the O.D., the weld seam more closely conforms to the contour of the tubing.

CONTOUR TRENTWELD®

stainless and high alloy pipe and tubing

TRENT TUBE COMPANY

Subsidiary of Crucible Steel Company of America • GENERAL OFFICES: East Troy, Wisc. • MILLS: East Troy, Wisc.; Fullerton, Calif.

Keep high alloy melts CLEAN

Photo courtesy Arwood Precision Casting Corporation.

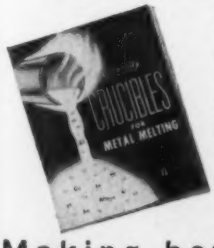
. . . with Norton Crucibles

You can pick the exact type of crucible you need for precision casting of high alloy steels from the wide NORTON line and have excellent protection against contamination.

No other crucibles give you such high stability to both heat and chemical action under a wide range of operating conditions. What's more, their fine, smooth surfaces are invaluable wherever molten metal must be kept free of refractory inclusions.

Specifically engineered for use in induction-type and indirect arc furnaces, these rugged NORTON Crucibles are ideal aids to critical casting techniques where both high precision and purity of the molded part are essential.

NORTON Crucibles can increase the precision, efficiency and economy of your casting operations. They're available in a wide variety of sizes. Get full details from your NORTON representative. And write for this new informative catalog on the *complete* line of NORTON Crucibles. NORTON COMPANY, Refractories Division, 204 New Bond Street, Worcester 6, Massachusetts.



*Trade-Marks Reg. U. S. Pat. Off. and Foreign Countries

MAGNORITE* K Crucibles (97% Fused Magnesia)
Widely used for melting steels and ferrous alloys as well as cobalt, chrome, copper, bronzes and nickel.

MAGNORITE M Crucibles (99% Fused Magnesia)
Designed to meet refractory requirements calling for low boron, iron oxide, and silica content.

ALUNDUM* A Crucibles (99% Alumina)
Provide outstanding stability in both oxidizing and reducing atmospheres. Ideal for vacuum melting.

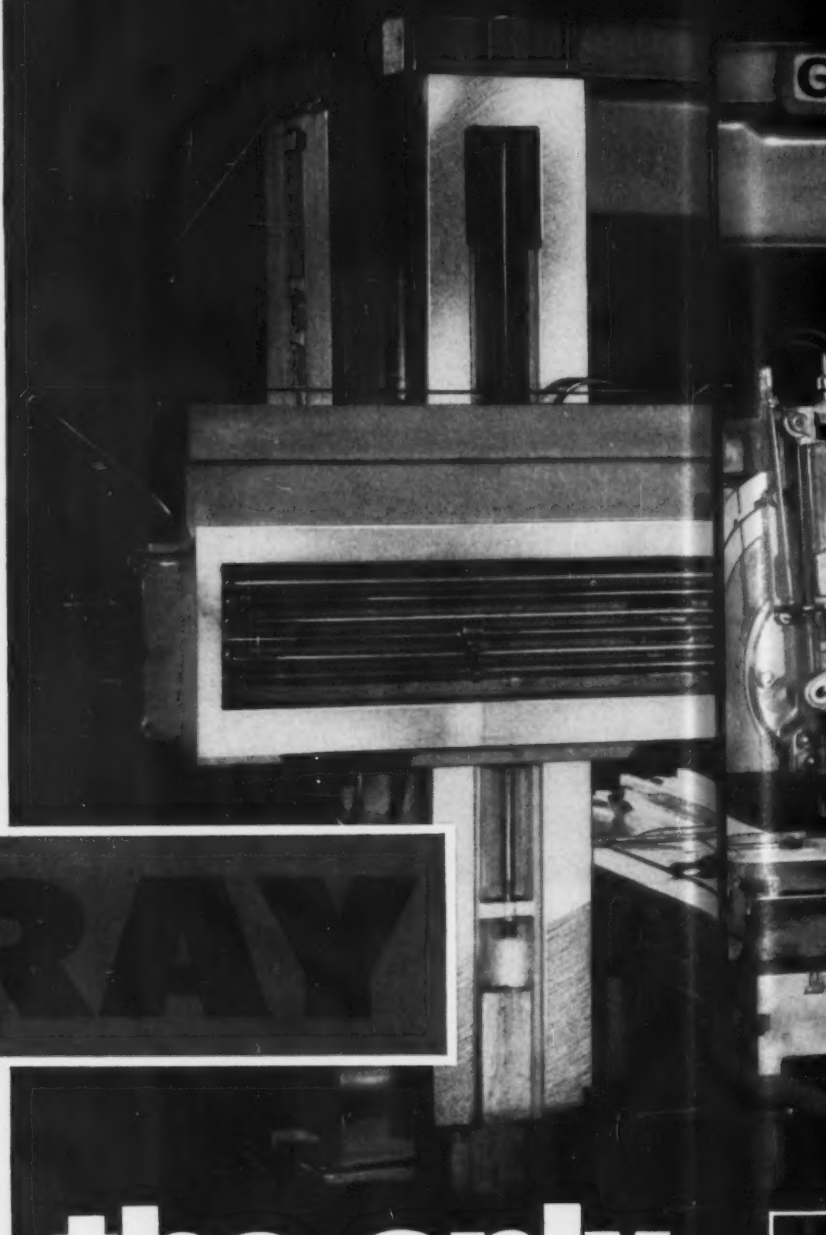
ZIRCONIA H Crucibles (Fused Stabilized Zirconia)
For operations where extremely high refractoriness and low thermal conductivity are required.

CRYSTOLON* Silicon Carbide Crucibles and other types of crucibles also available for melting nonferrous metals and alloys.

NORTON
REFRACTORIES
Engineered... By...Prescribed

Making better products . . . to make your products better

NORTON PRODUCTS Abrasives • Grinding Wheels • Grinding Machines • Refractories • Electrochemicals — BEHR-MANNING DIVISION Coated Abrasives • Sharpening Stones • Pressure-Sensitive Tapes



heavy-duty planing

The Gray Universal is the world's most powerful planer available for conventional planing. Its rigidity and speed are ideally suited for modern carbide cutting.

double-cutting

The flick of a lever, the touch of a button permits double-cutting. Elimination of the idle stroke insures the world's most efficient flat surface machining. Only simple carbide tools are required.

triple-cutting

Rough and rough-finish plane at the same time. Rough by double-cut planing and simultaneously rough-finish with a single point tool. Then finish plane without a tool change.

cross planing

Eliminates extra settings by cross planing the occasional keyways, chamfered corners, and other troublesome small cross surfaces that formerly added hours to your set-up time.

a GRAY

the only

This new 84" x 60" x 18' Gray Universal Planer shown in operation at the Koppers Co., cuts going - cuts coming, removes big chips at double rate. There is no idle return stroke to waste precious production hours. Instantaneous reversals with heavy duty double-cutting make this the first REAL new development in modern planers ...*a GRAY exclusive.*

Double tables further virtually eliminate the costly set-up time required by ordinary planers.

The multiple savings received by users of the new Gray Universal make it a wise investment.

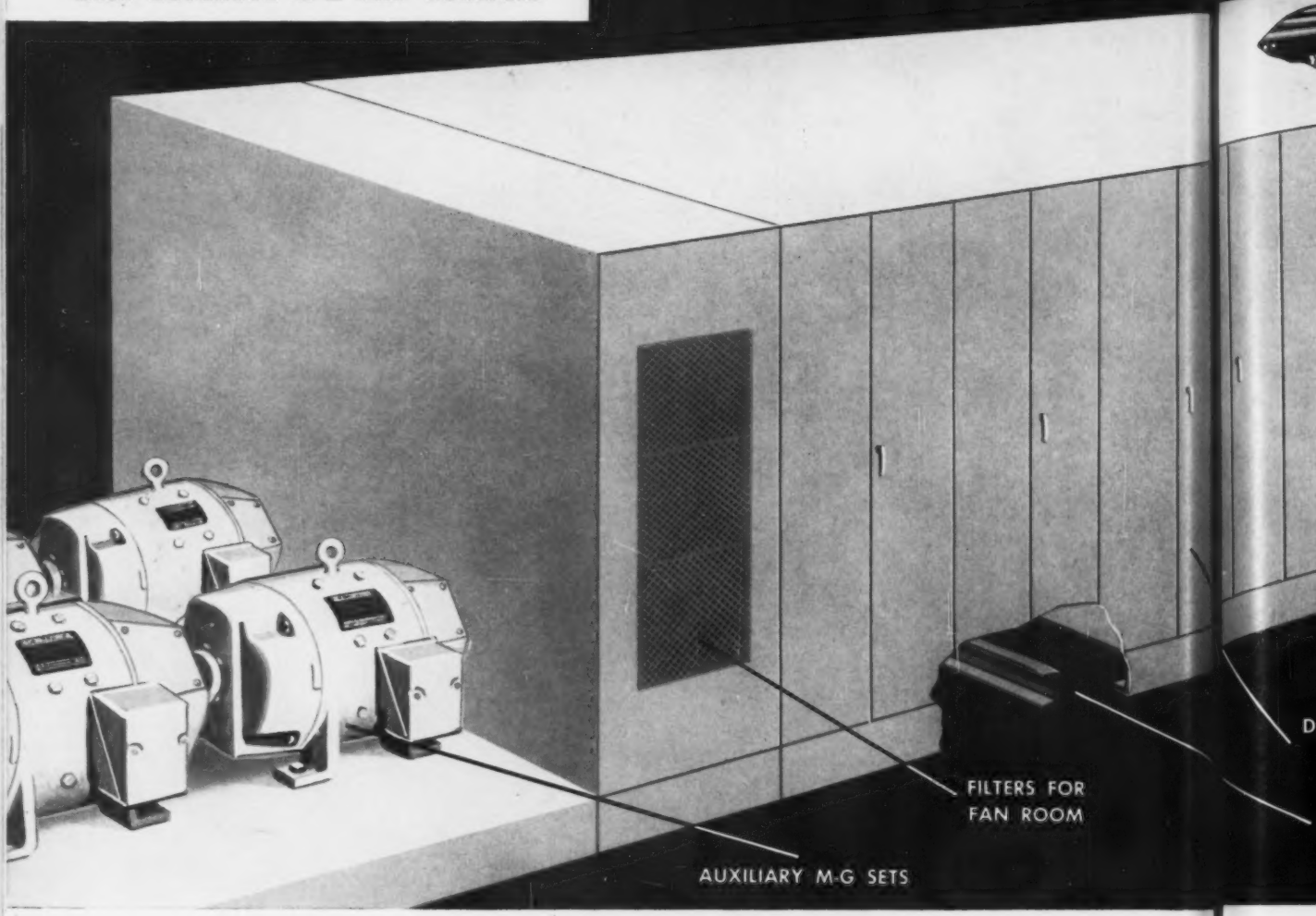
If it's new... it must be a GRAY.

The G. A. GRAY Co.,
Cincinnati, Ohio

GRAY Universal Planer shown in operation at the Baltimore plant of Koppers Company, Inc., Metal Products Division.

new planer

Greater efficiency — superior quality with advanced G-E mill controls



A NEW PRACTICE IN PROCESS-LINE CONTROL

G-E "packaged" motor-control rooms reduce

The latest innovation in modern steel-mill process-line control is General Electric's new "packaged" motor-and-control room. This novel design, developed jointly by General Electric and Jones and Laughlin Steel Corp., groups all controls and m-g sets into one compact centralized unit. The above unit will be installed at J&L's Aliquippa, Pa., works, as part of their continuing facilities-improvement program. Previously, the installation expense on this equipment often matched or exceeded the actual cost of the equipment. The new G-E motor-control room design cuts installation costs as much as 40 percent!

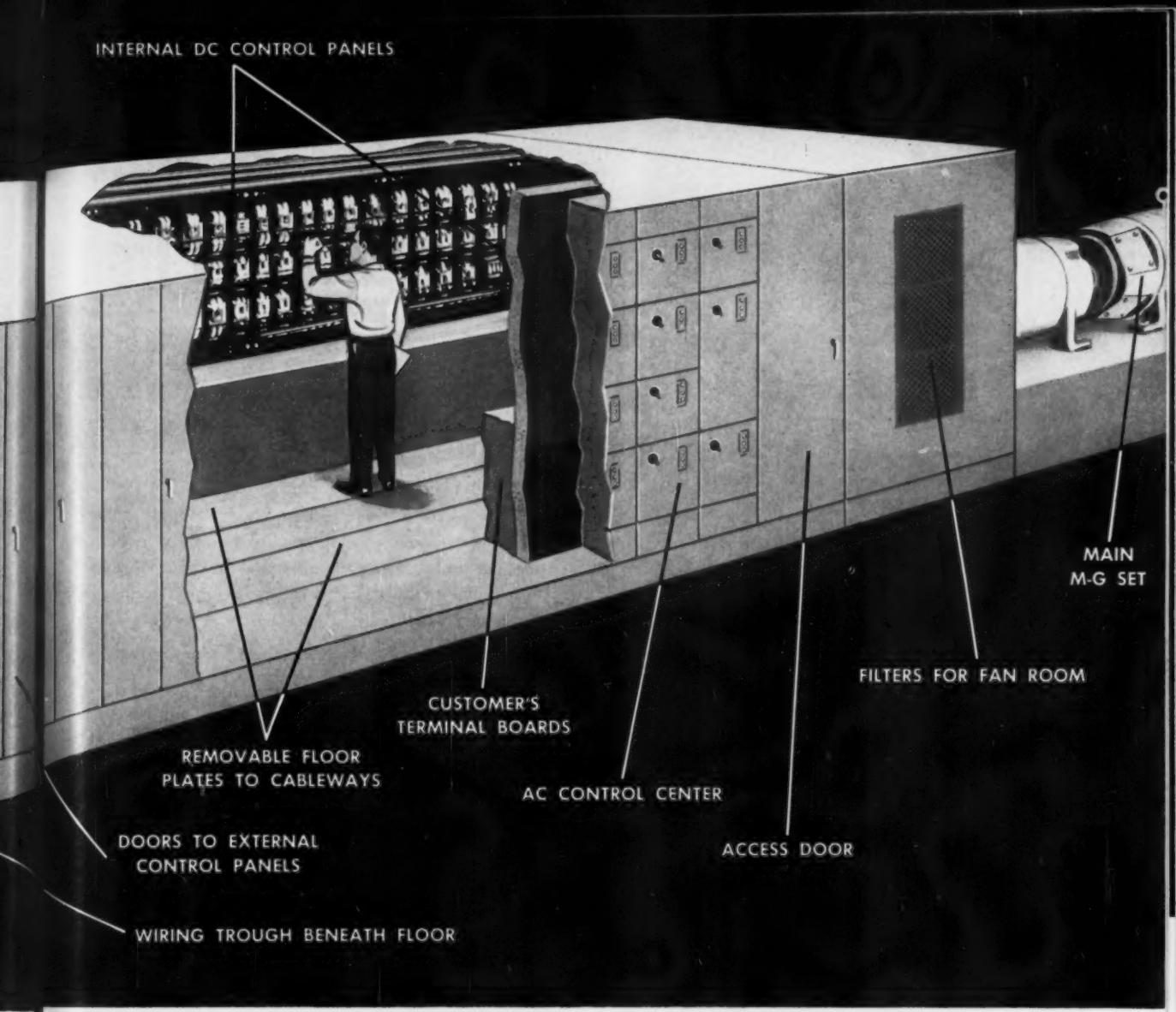
HERE'S WHY INSTALLATION COSTS ARE LOWER

Substantial savings on installation expenses can be realized through these features:

Independent control unit—The General Electric motor-control room is a completely co-ordinated, pre-assembled unit in itself, and in many cases, eliminates the need for a separate motor room. Since the motor-control room is self-contained, it may be located either near the driven equipment or in some previously unused area of the mill.

Field wiring is reduced by one-third or more—All internal connections are made and tested before the motor-control rooms are shipped. The only field wiring required is the connection of the power source and the leads to the operators' stations and the drive motors.

Construction engineering costs reduced—General Electric's grouped control concept enables the mill to know its conduit requirements much sooner. Thus, fewer,



installation costs as much as 40 percent!

less-complex construction diagrams are needed, and actual construction can begin at an earlier date.

Common base minimizes installation time—This new "packaged" motor-control room, delivered on its own self-supporting platform, can be immediately set on a normal mill floor. It does not require expensive, specially-constructed foundations. With m-g sets built and shipped on a common base, the need to align them at the mill site is eliminated. In addition, regulating equipment is factory-tested prior to shipment, further expediting startup time.

For all the details on this new technique in process-line control, contact your G-E Sales Engineer today! General Electric Company, Industry Control Department, Roanoke, Virginia, and Direct Current Motor and Generator Department, Erie, Pennsylvania. 823-6

Progress Is Our Most Important Product

GENERAL ELECTRIC

Republic Steel Provides Pig Iron
SERVICE IN DEPTH

UNIFORM CHEMISTRY HELPS PRODUCE HIGHEST QUALITY DIE SETS. The Producto Machine Company, Bridgeport, Connecticut, casts die set parts using only raw materials with a definite known analysis, including Republic Pig Irons. The year-in, year-out uniform chemistry of these fine irons helps Producto produce high quality, laboratory-controlled castings. The company has found that there is no better, no more economical means for insuring strong, flaw-free, easy-to-machine castings.

Pig iron *service in depth* is an exclusive Republic concept. It is designed to help you solve foundry production and metallurgical problems—designed to help you produce better castings most efficiently, economically, and profitably.

Here is how *service in depth* helps foundrymen everywhere.

First, Republic is the only producer of both Northern and Southern Irons. This means you can select the proper grade from the most complete line of merchant pig iron available in the industry. Northern grades include Chateaugay, Malleable, Bessemer, Foundry, and Basic. Southern furnaces produce Foundry and Basic.

Then, Republic provides expert metallurgical service to assist you in selection, application, and processing. Republic Pig Iron Metallurgists are frequent and welcome visitors in hundreds of foundries. They have at their fingertips information on the latest processes and techniques available for improving castings, and for expanding their use and sale. Their suggestions often result in improved operations, increased production efficiency, and in recapturing business lost to other methods of fabrication.

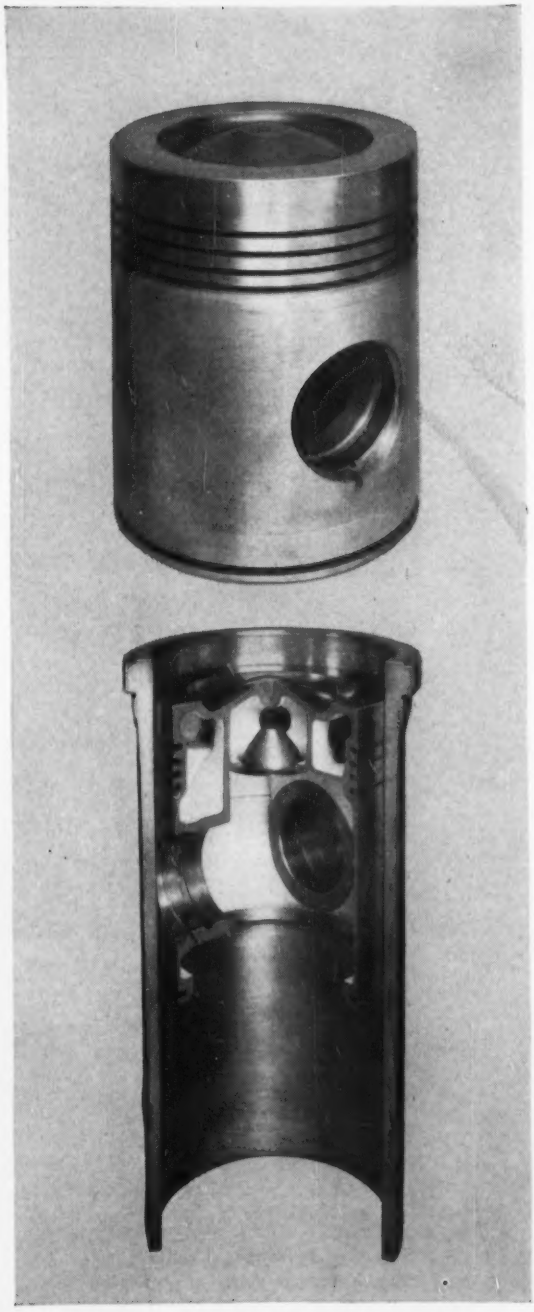
Service in depth is available now. Clip and mail the coupon for obligation-free metallurgical service, or for more information on Republic Pig Irons.

Here are three examples of pig iron *service in depth.*

REPUBLIC

World's Widest Range of Standard Steels

CHATEAUGAY AGAIN PROVED IDEAL BASE METAL FOR DUCTILE IRON. Problem: Design a diesel engine piston with high mechanical strength, minimum weight, maximum wear- and heat-resistance, low ultimate cost. Using Chateaugay Pig Iron as the base metal, Hunt-Spiller Manufacturing Corporation, Boston, Massachusetts, successfully met all of these requirements in developing ductile iron diesel pistons as a replacement for aluminum. High total carbon and unusually low phosphorus, silicon, and manganese suit Chateaugay perfectly for ductile iron use. Inherently excellent physical properties are maintained in the ductile form assuring strong, flaw-free casting accurate to patterns and shapes.



METALLURGICAL SERVICE BENEFITS FOUNDRY'S CUSTOMER. On the advice of a Republic Pig Iron Metallurgist, Atlantic Foundry Company, Akron, Ohio, switched to Chateaugay Pig Iron for ram and cylinder castings used in hydraulic presses. The result: stronger castings, better machinability, higher wear-resistance, and a 21% saving to the customer. The value of Republic metallurgical service is pointed out in this statement by Atlantic's Vice President of Iron Foundry Operations. "When we have a foundry problem and put in a call for help, your metallurgical engineers are Johnny-on-the-spot, talking a language we can understand. Then it's not long before the problem is solved."

STEEL

and Steel Products

REPUBLIC STEEL

REPUBLIC STEEL CORPORATION
DEPT. IA -7842
1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

☐ Have a Pig Iron Metallurgist call.

Send more information on:
☐ Republic Pig Irons

Name_____ Title_____

Company_____

Address_____

City_____ Zone____ State_____

WHY DID THIS BOLT FALL OFF?

Where is the culprit . . . the nut whose function was to keep the bolt securely in place? Undoubtedly it fell off earlier . . . loosened by vibration . . . or unexpectedly high shock loads due, perhaps, to a careless operator. In any event, the bolt was pounded into uselessness . . . and failed. Chances are that the equipment the bolt and nut were part of is temporarily useless too.

Why then, was an inadequate fastener applied in the first place? Perhaps because "bolts and nuts" are often overlooked or specified routinely. Perhaps to save a fraction of a cent. Whatever the reason, the end result was inefficient and uneconomical. The nut failed—the fastening failed—and the product failed.

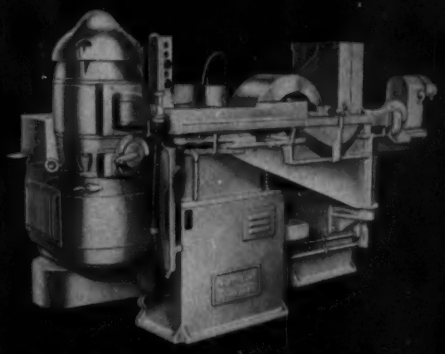
It could have been prevented. An Elastic Stop® nut would have held on. The small extra cost of the *best* self-locking nut would have solved this case . . . saved repair bills . . . downtime . . . and a manufacturer's reputation.

For detailed photos showing how some of America's foremost manufacturers of heavy equipment have insured critical bolted connections with Elastic Stop nuts on such units as rock drills, scrapers, snow plows, off-the-road trucks . . . write to ESNA. Or, for first hand proof, tell us the preferred size and we'll send you test samples. Address: Dept. S35-577, Elastic Stop Nut Corporation of America, 2330 Vauxhall Road, Union, New Jersey.

DOUBLE DEPENDABILITY

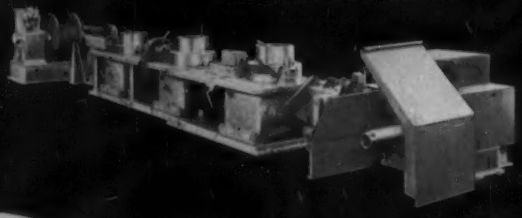
The dependability built into every Elastic Stop nut builds itself into the dependability of every product on which it is used.

ELASTIC STOP NUT CORPORATION OF AMERICA



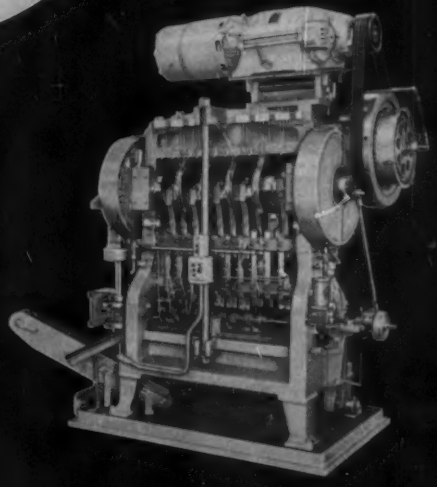
COLD HEADING
MACHINERY

EYELET, SLITTER
& WIRE
MACHINERY

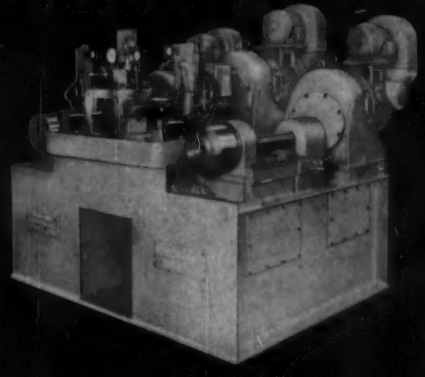


WATERBURY FARREL
MACHINERY BUILDERS

POWER
PRESSES



ROLLING MILL
MACHINERY



THE WATERBURY FARREL FOUNDRY & MACHINE CO.
DIVISION OF TEXTRON INC.
Waterbury, Connecticut • U.S.A.
Sales Offices: Chicago • Cleveland • Los Angeles • Millburn, N. J.

TEXACO ORGANIZED LUBRICATION CAN HELP YOU...

Get rid of the "guns" that "misfire"

His grease guns are aimed at your profits; they can help boost them—or eliminate them altogether. Here's why:

You used to need a different grease for nearly every job. That meant 20 or 30 lubricants in the plant, with the almost inevitable danger of misapplication — and damaged machinery.

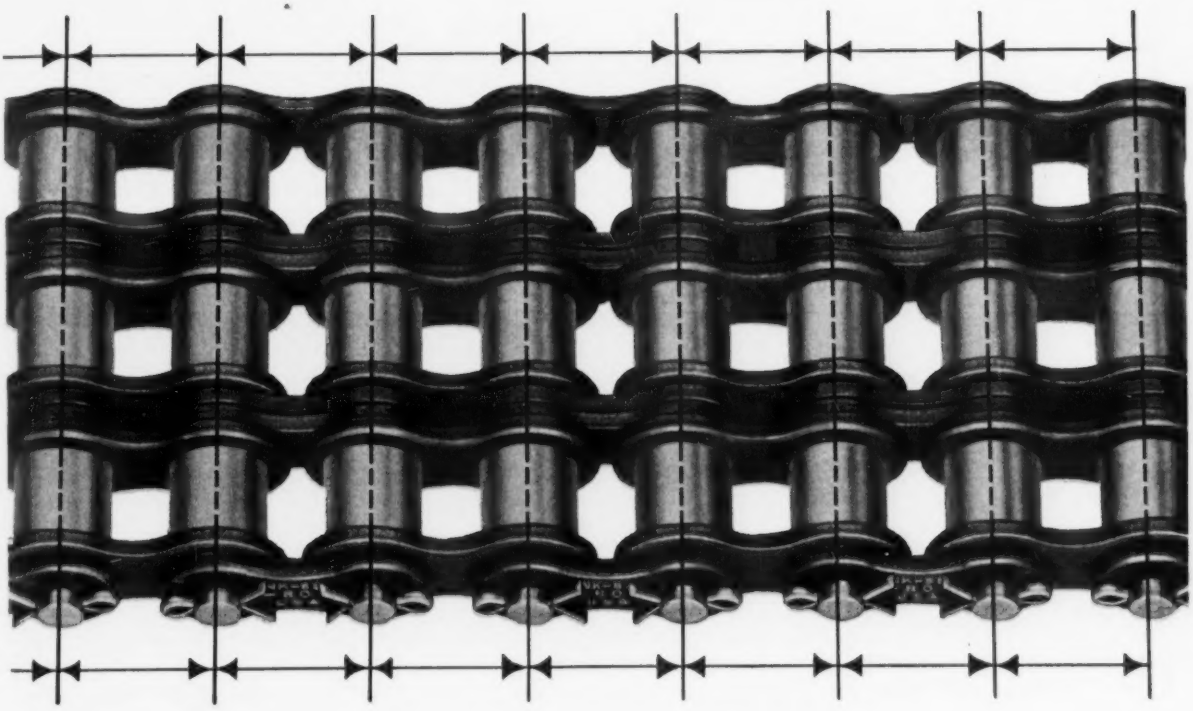
Unless you're operating on the basis of a modern lubrication survey, *the chances are that this situation still exists in your plant!*

A Texaco Organized Lubrication Plan uses a minimum number of proper oils and greases—including newly developed multipurpose lubricants—to reduce your inventory by as much as 80% and virtually eliminate this problem.

Get the details on Texaco Organized Lubrication. Contact your local Texaco Lubrication Engineer or write for "Management Practices that Control Costs via Organized Lubrication."

Texaco Inc., 135 East 42nd Street, New York 17, N. Y., Dept. IA-100.

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL



Equal length... equal strength

How pre-stressing ensures uniform load distribution of multiple-width LINK-BELT roller chain

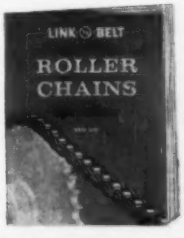
Pre-stressing is one of the reasons why Link-Belt multiple-width precision steel roller chains easily handle the grueling loads common on today's drives. It seats and cold works the chain joint parts, assuring equal load distribution across the chain, minimum initial elongation, increased fatigue life.

Pre-stressing is just one of many "extras" that contribute to the *greater dynamic strength* of Link-Belt roller chain. Others include: close heat-treat control, lock-type bushings, shot-peened rollers, pitch-hole preparation. For details see Book 2657.

PRE-STRESSING MACHINE provides the pull that "sets" the parts of Link-Belt multiple-width roller chain. Besides assuring uniform load distribution, pre-stressing eliminates application difficulties on fixed center drives because the chain leaves the factory at precise operational length.

LINK-BELT

ROLLER CHAINS AND SPROCKETS

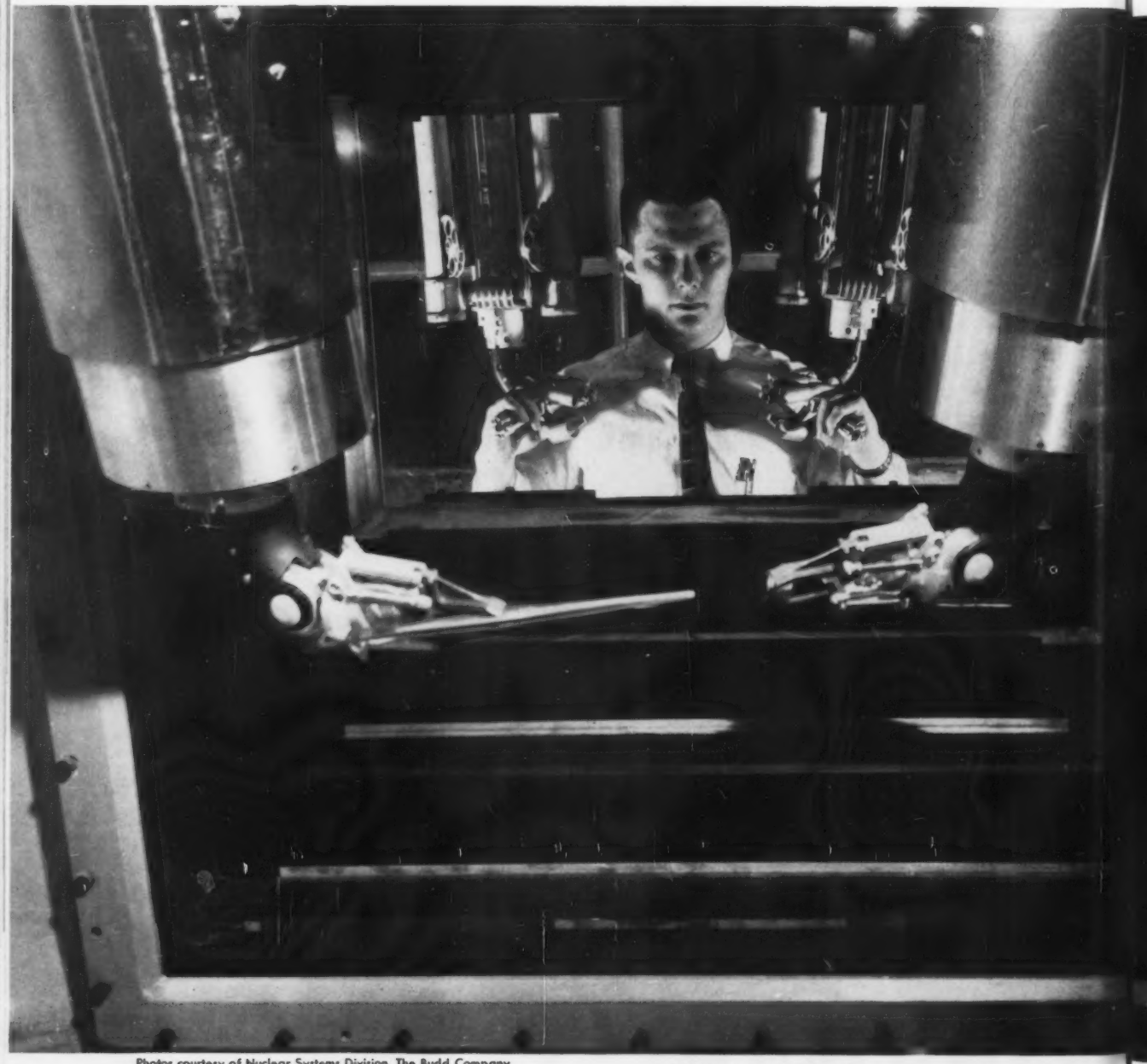


BOOK 2657 has 154 pages of roller chain data. Contact your nearest Link-Belt office or authorized stock-carrying distributor. (See CHAINS in the yellow pages of your phone book.)

15,077

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Australia, Marrickville (Sydney); Brazil, Sao Paulo; Canada, Scarboro (Toronto 13); South Africa, Springs. Representatives Throughout the World.

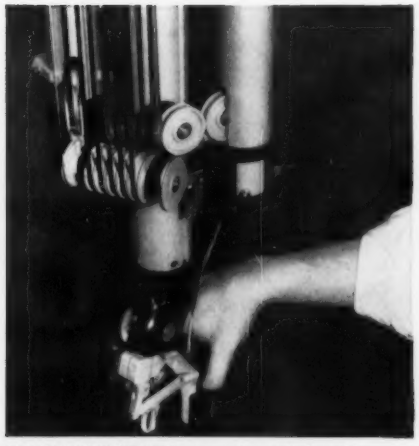
How NS solved another special steel problem



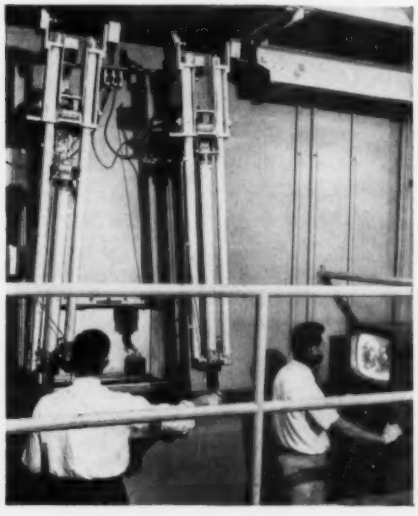
Photos courtesy of Nuclear Systems Division, The Budd Company

RADIOACTIVE MATERIAL is handled remotely by operator from behind three-foot thick lead-glass wall. Nilcor strips, which make quick, accurate system response possible, can be seen running vertically from pulleys just above operator's hands.

SPECIAL NS-ATHENIA STEEL PUTS LIFE IN ATOMIC-AGE ROBOT



HAND MOVEMENTS at operator end of master-slave system are translated without distortion, or time lag through seven Nilcor strips (shown in photo) that travel through 15-foot belt and pulley system.



OPERATOR STATION, shielded by protective wall, has television monitor screen where action inside radioactive room is reproduced as operator manipulates controls of master-slave system.

To manipulate radioactive materials with lifelike dexterity, from the other side of a three-foot thick protective wall, requires robot controls with a high degree of precision and quick response.

Ordinary cable or belt arrangements gave too much stretch between the operator's "master" hand movements and the identical "slave" movement at the other end of the system. Movements had to be translated almost instantaneously and duplicated exactly at the slave end of the system. To help solve this problem, robot system manufacturers came to the Athenia Steel Division of National-Standard to find a strip material that would serve in the belt-and-pulley arrangement of the mechanism with minimum stretch and friction and without backlashing or overshooting.

NATIONAL-STANDARD ENGINEERS at Athenia in Clifton, N. J., recommended Nilcor* strip (basically a cobalt-chromium-nickel alloy) because of its high fatigue resistance, high tensile strength and exceptionally high corrosion resistance—plus less than ⅛-inch lateral sweep per 8-foot length when laying flat without tension. Experiments with .005 Nilcor strip in the robot systems showed an 80% reduction in stretch and 90% reduction in friction over standard wire materials.

EXPERIENCED ENGINEERING HELP of this kind, for jobs requiring specialty steel and wire to meet unique applications, is available to *you* from National-Standard. For the many thousands of applications where only specialty steel or wire will solve the problem, let National-Standard engineers go to work for you. Write for additional information to National-Standard Company, Niles, Michigan.

*Trade Mark

Manufacturer of Specialty Wire and Metal Products

NATIONAL STANDARD

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; tire wire, stainless, music spring and plated wires • **WORCESTER WIRE WORKS** Worcester, Mass.; high and low carbon specialty wires • **WAGNER LITHO MACHINERY,** Secaucus, N. J.; metal decorating equipment • **ATHENIA STEEL,** Clifton, N. J.; flat, high-carbon spring steels • **REYNOLDS WIRE,** Dixon, Ill.; industrial wire cloth • **CROSS PERFORATED METALS,** Carbondale, Pa.; decorative, commercial, and industrial perforated metals.

WHY BUY METAL YOU DON'T USE?

Switch to Allegheny Ludlum Cast-to-Shape Tools

FORGED DISC

Forged disc necessary for fabricating welded tube mill roll.

CAST-TO-SHAPE TOOL STEEL

Cast-to-shape welded tube mill roll. 220 lbs. lighter than forging; $780 cheaper for finished shape.

$780 Saved by changing to Cast-to-Shape

Why pay for metal that ends up chips on your floor? Here are two pertinent reasons why you should stop hogging your complex tools from blocks of metal and let Allegheny Ludlum cast them to shape.

CAST-TO-SHAPE MEANS YOU BUY FEWER POUNDS OF METAL.
For example, the roll shown above is 220 pounds *lighter* in the rough state than its forging cousin. Allegheny Ludlum cast-to-shape tools are more economical than tool steel forgings, *and* just as strong in certain applications.

CAST-TO-SHAPE MEANS LESS FINISH MACHINING.
This is especially important with a complex shape. For instance, the casting above has only ¼ to ⅜ inches of machine stock on its surfaces, requiring only one roughing and one finishing operation. Estimated savings by using an Allegheny Ludlum cast-to-shape tool amount to $780.

WSW 7271

Allegheny Ludlum, a tool steel producer who makes cast-to-shape tools, casts them with the same precise quality control for which their tool steels is known. A full line of cast-to-shape tool steel grades is available. You'll find ones with high resistance to abrasion, compressive strengths of approximately 400,000 psi, easy machinability, hardening with almost no distortion, toughness, high red hardness, and the capacity to take a high polish.

Find out now how you can cut costs on your complex tools. Write for FC-4, a 28-page technical discussion of A-L's Forging and Casting Division with applications, pattern information, design tips, analyses, and heat treating instructions. Or call your nearest A-L tool steel warehouse or distributor.

ALLEGHENY LUDLUM STEEL CORPORATION, OLIVER BUILDING, PITTSBURGH 22, PENNA. Write to Dept. A-171.

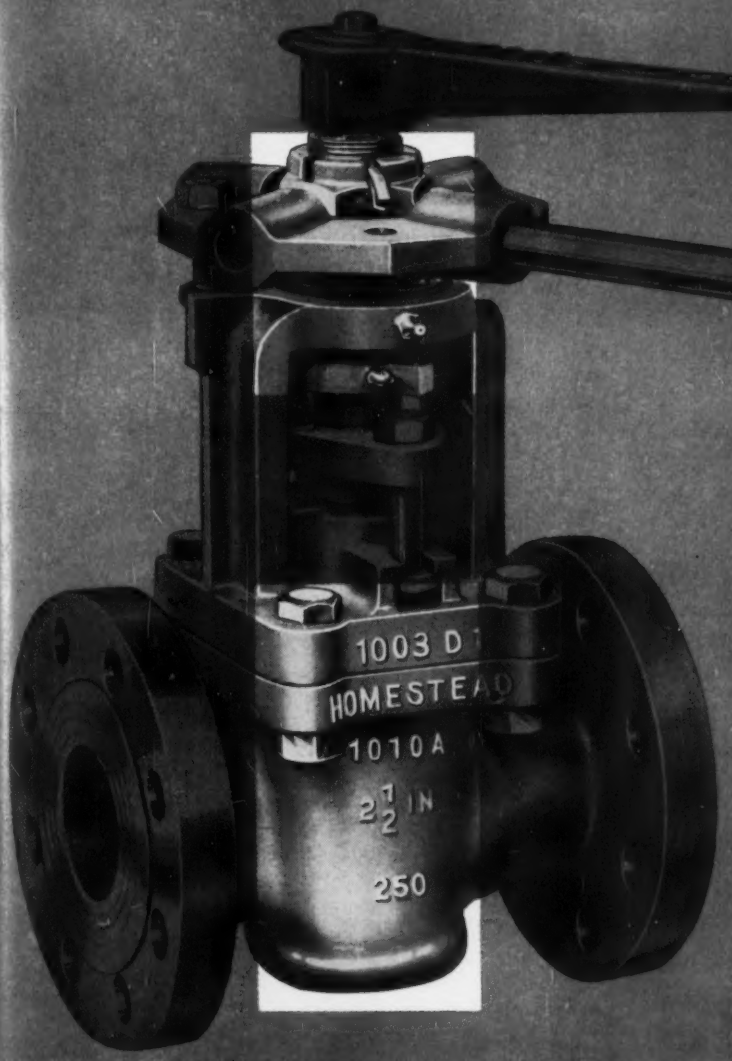
ALLEGHENY LUDLUM

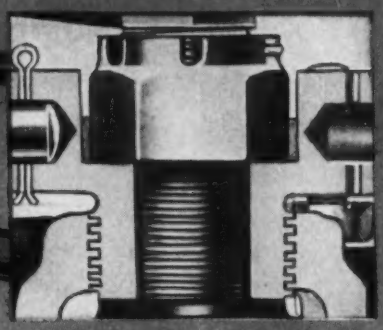
Tool Steel warehouse stocks throughout the country . . . Check the yellow pages

EVERY GRADE OF TOOL STEEL . . . EVERY HELP IN USING IT

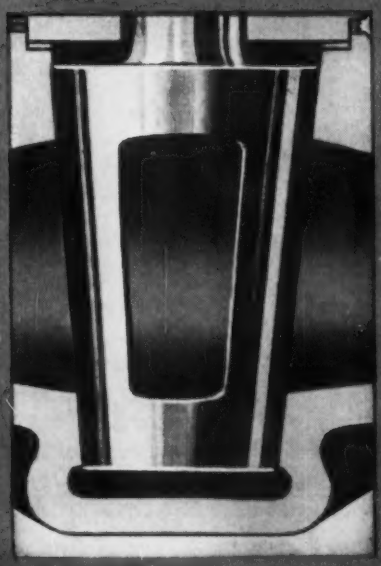
In the spots that count... Homestead® Valves are

STICK-PROOF





Built-in lever and screw affords instant operation



Seating pressure is mechanically relieved for easy turning

TROUBLE-FREE SERVICE is assured under all fluid, temperature and pressure conditions by the exclusive design of Homestead Lever-Seald Valves.

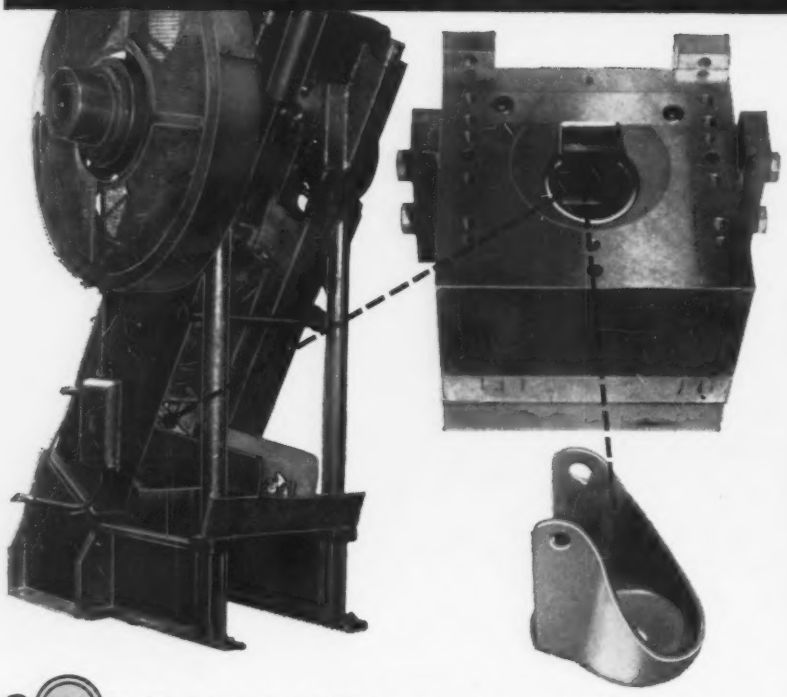
Instant stick-proof operation is guaranteed by a built-in lever and screw which mechanically relieves seating pressure. This controlled relief of pressure is only sufficient to overcome friction and to permit the plug to turn freely. What's more, all operating parts are protected from the damaging effects of corrosive or erosive service conditions and are completely weatherproof.

Write today for fully detailed Reference Book 39—Section 3. See for yourself how Homestead Lever-Seald Valves can solve your problems on high temperature, pressure or corrosive services.

h
v

HOMESTEAD VALVE MANUFACTURING COMPANY
P. O. Box 23 Coraopolis, Pa.

Talide® DIE IN SERVICE 8 YEARS DRAWS 9,000,000 CASTER PARTS!

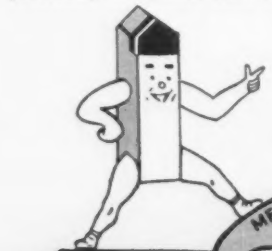


Bassick COMPANY, Bridgeport, Connecticut, leading producer of casters, chair controls, automobile and specialty hardware, was experiencing difficulty drawing an eccentric shaped chair caster part from commercial quality hot rolled drawing steel.

Scrap rate was high—production per die low. The high-speed steel die being used (costing $350.00) had to be reground and polished every 30,000 pieces, and replaced several times a year.

A Grade C-85 Talide die (costing $1100.00) was installed in 1950 and to date has produced over 9,000,000 caster parts. During this 8-year production run, the Talide die has required no servicing and is still in operation.

Bassick Company engineers report that the quality of their product has been improved. Surface marks and scratches, caused by scoring and galling of the steel dies previously used, have been completely eliminated.



A Talide die engineer can help you cut costs and increase production on draw presses, punch presses, pill presses, cold headers, swagers and draw benches.

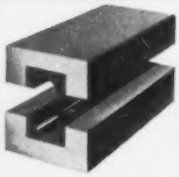
METAL CARBIDES CORPORATION
6001 Southern Boulevard Youngstown 12, Ohio

Send for 76-Page Catalog 56-G

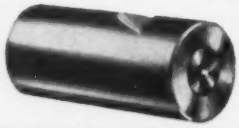
METAL CARBIDES CORPORATION
MC
TALIDE®
YOUNGSTOWN 12, OHIO

HOT PRESSED AND SINTERED CARBIDES • VACUUM METALS
HEAVY METAL • ALUMINUM OXIDE • HI-TEMP. ALLOYS
OVER 25 YEARS' EXPERIENCE IN TUNGSTEN CARBIDE METALLURGY

WIRE DIES
Hundreds of miles of steel and non-ferrous wire—.004 to .750—drawn through TALIDE dies.

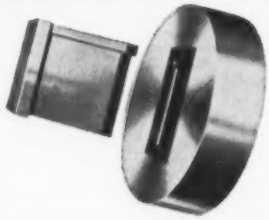


SWAGING DIES
Leading fountain pen manufacturer cold swages 33 times more stainless steel parts with TALIDE dies.



HEADING AND EXTRUSION DIES
Cold heading ¼" C-1008 rivets. TALIDE dies produced 11,200,000 pieces, other carbide dies only 3,500,000.

CURLING ROLLERS
TALIDE curling rolls last 65 times longer than steel rolls on beverage can forming operation.



BLANKING AND FORMING DIES
70 times more paper discs blanked out with TALIDE—over hard alloy die.

SHEET METAL DIES

137,000 hi-alloy steel pressure vessels drawn with TALIDE against only 7,900 with steel dies previously used.

POWDERED METALLURGY DIES
Compacting highly abrasive chemical powders, TALIDE pill dies last 4 months; steel dies wore out in 6 hours.

The name known and respected the world over. For the name of ALLIANCE carries the mark of quality. Alliance equipment means greater production, maximum operating performance and greater return for investment.

As a symbol of service,

ALLIANCE LEADS THE WAY.

Give us the Runway... and We'll Lift the World.

Alliance

machine company

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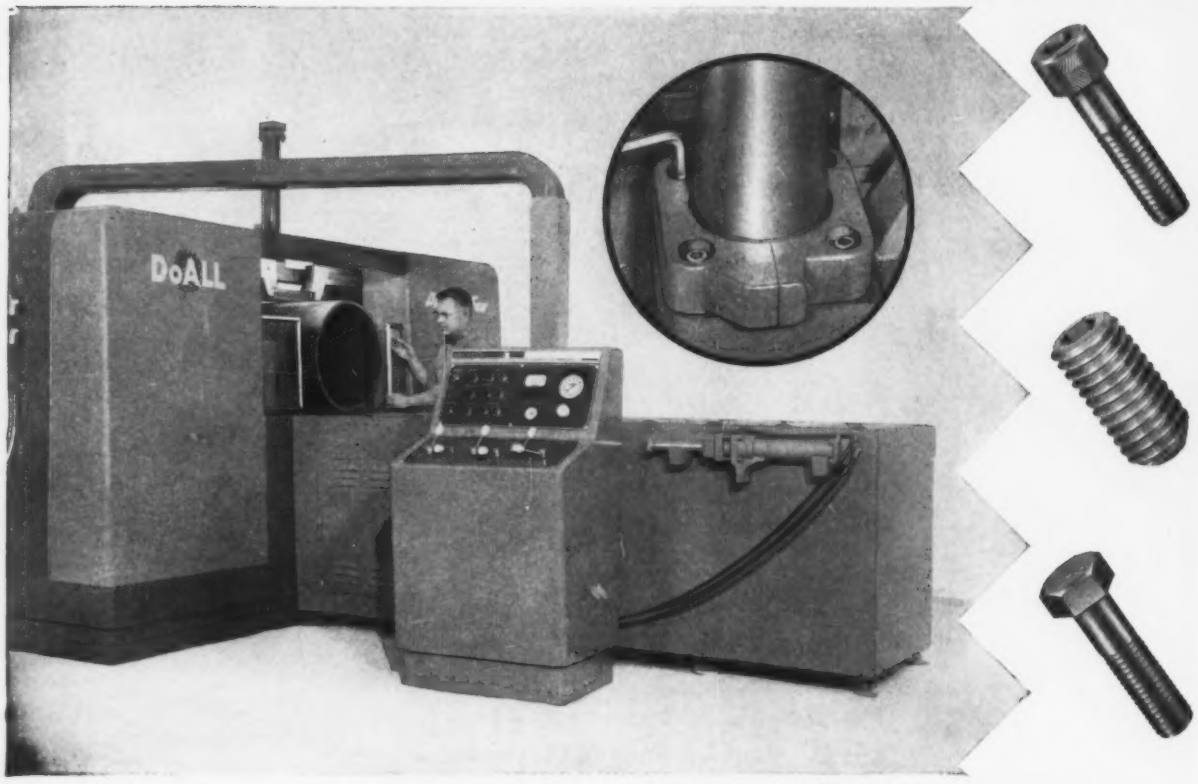
IT PAYS TO STANDARDIZE ON **STANSCREW**



Stanscrew fasteners meet DoALL standards for high strength, rigidity, "clean" design

This outstanding machine was developed by the DoALL Company to handle industry's largest, toughest cut-off jobs. Not a beefed-up model of existing machines, this "biggest band saw built" is a unique new design. As one example, the cutting head travels vertically, but cutting takes place on the lower edge of the top saw band.

The new design of this unit, Model C24, therefore represents an entirely new concept of rigidity, applied power, and precision control. These basic considerations dictated the selection and application of every part . . . including, of course, the fasteners.

Small wonder, then, that DoALL's design engineers, after consultation with Stanscrew's fastener specialist, selected Stanscrew socket cap screws for vital applications such as attaching hydraulic cylinders. These reliable fasteners provide the high strength needed. Correctly applied, they give assurance against misalignment even after extensive use—a must in this precision machine. And, by permitting flush, snag-free surfaces, the fasteners also contribute to the C24's superior styling.

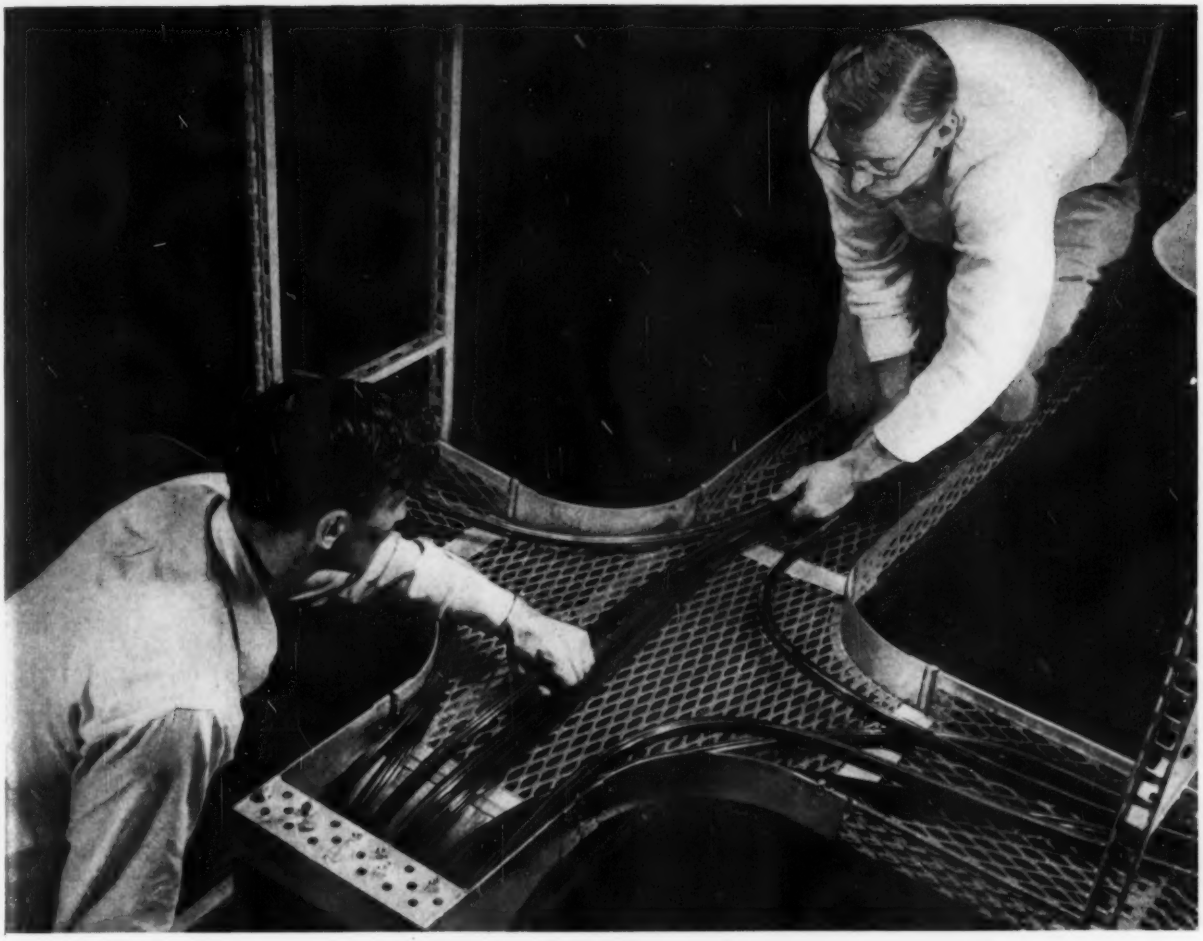
Like DoALL, other leaders of American industry are learning the advantages of calling in a Stanscrew specialist when a new product is on the drawing boards. His wide experience can often suggest ways to cut fastener or assembly costs . . . for example, by substituting a standard fastener for a costly special. He can make suggestions from Stanscrew's complete line of over 4,000 types and sizes, always in stock and quickly available.

So whatever your requirements in fasteners, call your Stanscrew distributor today. He will gladly arrange for a prompt visit from the Stanscrew fastener specialist.

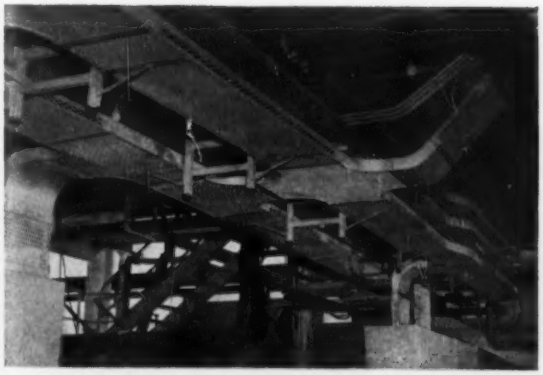
STANSCREW FASTENERS

CHICAGO | THE CHICAGO SCREW COMPANY, BELLWOOD, ILLINOIS
HMS | HARTFORD MACHINE SCREW COMPANY, HARTFORD, CONNECTICUT
WESTERN | THE WESTERN AUTOMATIC MACHINE SCREW COMPANY, ELYRIA, OHIO

STANDARD SCREW COMPANY 2701 Washington Boulevard, Bellwood, Illinois



Strong, lightweight cable troughs illustrate the versatility of expanded metal



An installation of expanded metal cable troughs, made by T. J. Cope Division, Rome Cable Corp., Collegeville, Pa.

To understand why Penmetal expanded metal has such widespread and diversified application, note the important benefits resulting from its use in T. J. Cope cable-supporting systems.

The extreme lightweight of expanded metal makes cable troughs easy to install . . . without costly structural supports . . . yet with plenty of strength to take the weight of the cables. The open mesh simplifies cable inspection and repair. Low cost means large quantities can be used economically.

Of course, your company may never want to build cable troughs. But, if you make any product demanding a mesh, you can profit from expanded metal versatility. Available in a wide variety of mesh sizes in carbon steel, aluminum, stainless steel and other metals — standard or flattened. Readily cut, shaped or welded.

Send for full information about Penmetal expanded metal. Ask for a copy of catalog 515-EM.

PENN METAL COMPANY, INC.

General Sales Office: 40 Central Street, Boston 9, Mass.
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Penmetal 1850

a name to remember

PM-194

Fast moving Macomber. ba

An example of progress, Robert Macomber, president, displays one of Macomber's fine products—V-Lok structural framing that goes together without bolts, rivets, or welds.

PHOTO BY KARSH OF OTTAWA

r. bases growth on advanced engineering–

Quality Steels

Quality steel is vital according to James E. Stiles, vice president of production at Macomber.

Since the war the construction industry has experienced phenomenal growth. Even so, few concerns associated with the construction business were able to record progress at the pace set by Macomber Incorporated, Canton, Ohio, manufacturer of steel joists, roof decking, and structural steel framing.

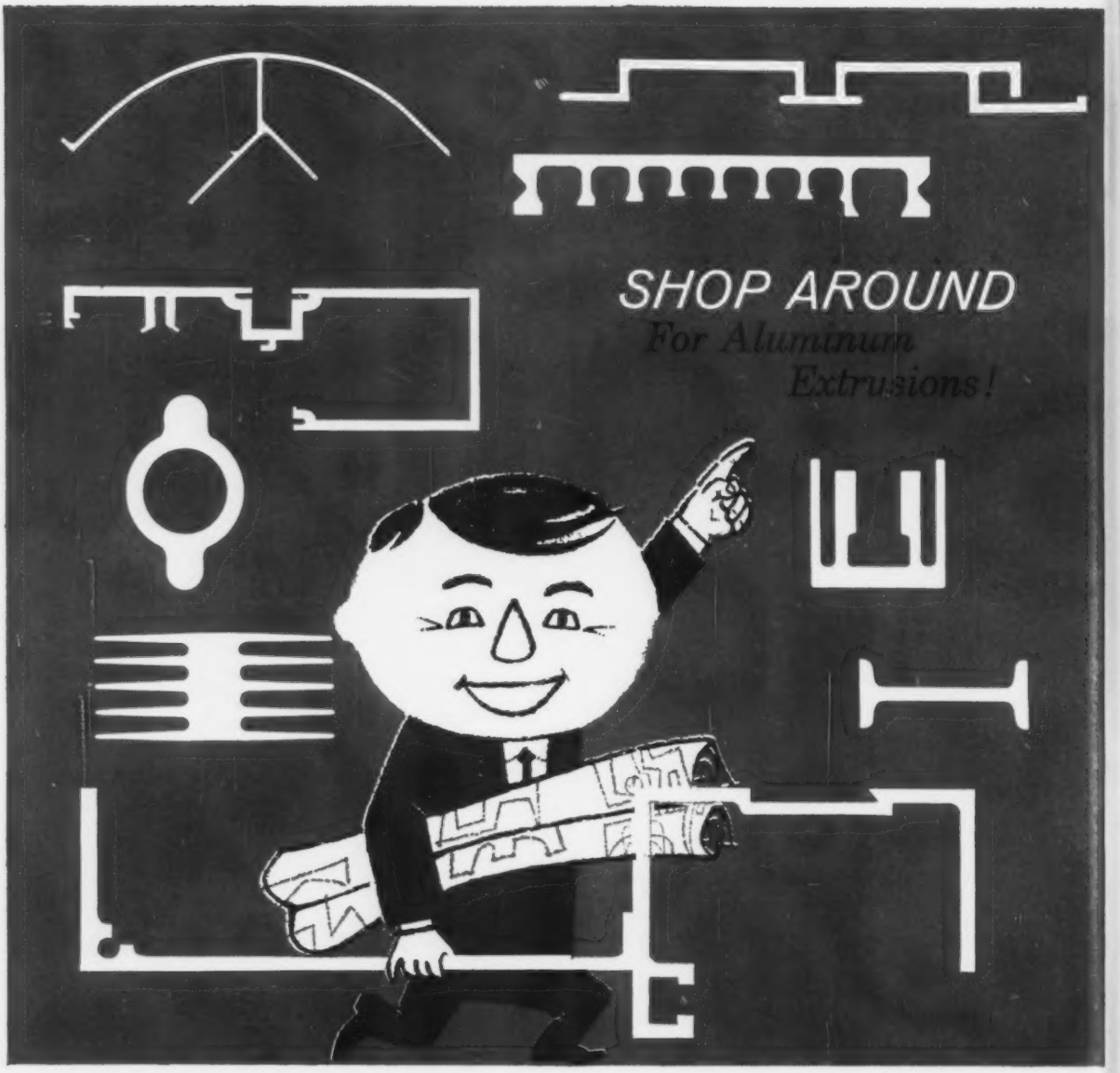
"Advanced engineering—quality product", Macomber executives agree were the main reasons for their steady drive to national prominence. "Our engineering is second to none", says Robert Macomber, president, "and we're extremely quality conscious. In this area we know we have to rely on quality minded suppliers. We like the steel from *Sharon Steel Corporation, Sharon, Pa.*"

Reliable steel service is necessary in the fast moving construction business says Norman C. McGregor, purchasing agent, shown here with Sharon salesman Lynn Houston.

The best designs result from a good knowledge of materials and faith in the supplier to deliver, says J. W. Hubler, vice president of engineering.

SHARON *Quality* **STEEL**

SHARONSTEEL



You'll realize how much more BRIDGEPORT offers!

After you've "looked 'em all over," it's refreshing to see the special and scrupulous care Bridgeport devotes to *every* order, large or small. No other maker of aluminum extrusions and forgings offers this unique *combination* of seven prime advantages!

Bridgeport has . . . ❶ the capacity of a large producer, but the flexibility and interest in your problems of a small one . . . ❷ Massive extrusion capacity for no-delay deliveries . . . ❸ Extensive casting facilities permitting quality control from raw materials to finished products . . . ❹ Bridgeport-owned die shops employing the most skilled craftsmen, the most advanced equipment, to produce perfect dies for extrusions, hot and cold forgings, impacts . . . ❺ Complete testing and inspection facilities, including ultrasonic immersion . . . ❻ Widely experienced metallurgists, production and engineering people, working *full effort* on aluminum . . . ❼ Research and development facilities, specializing in light metals, and adding constantly to Bridgeport's unsurpassed knowledge in this field.

Our ideas on using aluminum to *your* advantage are yours for the asking! Call your nearby Bridgeport Man if you have *anything* requiring aluminum on the drawing boards. He'll be glad to help. And if you'd like to know more about us, write today for our free booklet, Bridgeport Aluminum Extrusions. Dept. 2302.

BRASS Bridgeport CO.

BRIDGEPORT BRASS COMPANY

BRIDGEPORT 2, CONNECTICUT

Specialists in Metals from Aluminum to Zirconium

success assured . . . by Ansco

Regardless of the care taken during initial casting steps, perfection can never be guaranteed. But you can make sure that defective parts never reach your customer and injure your reputation.

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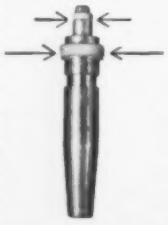

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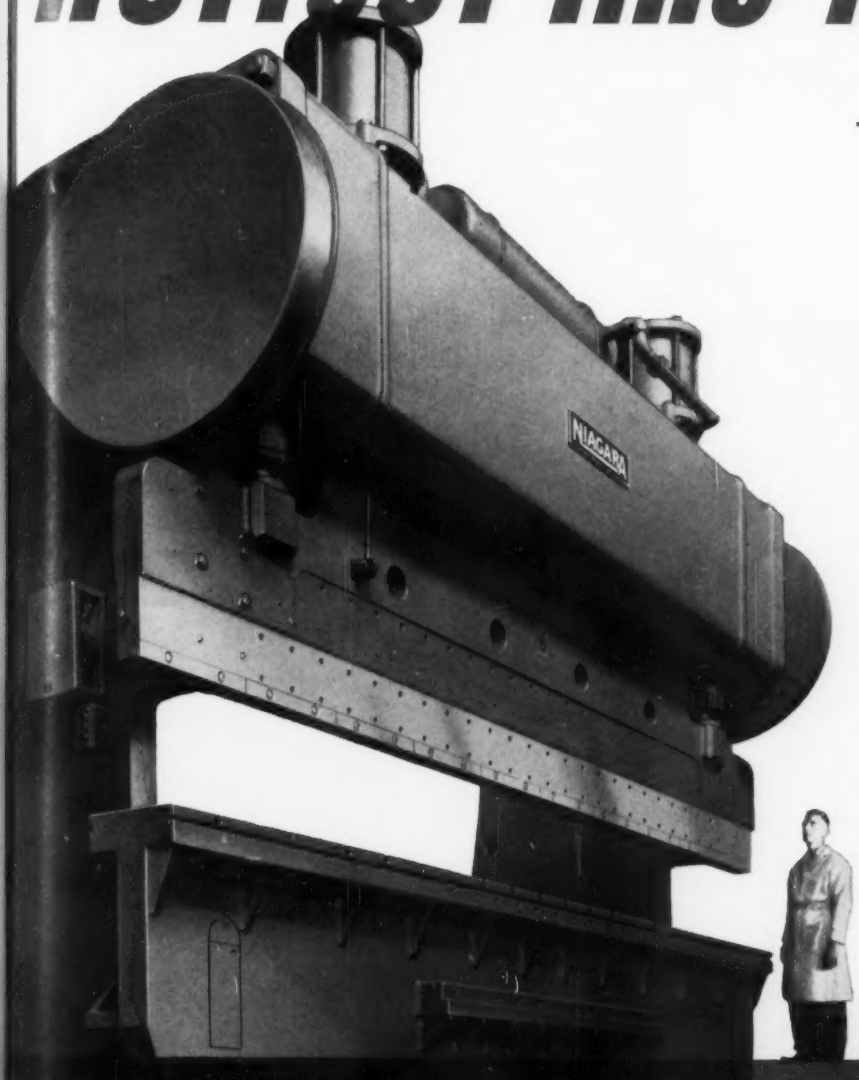

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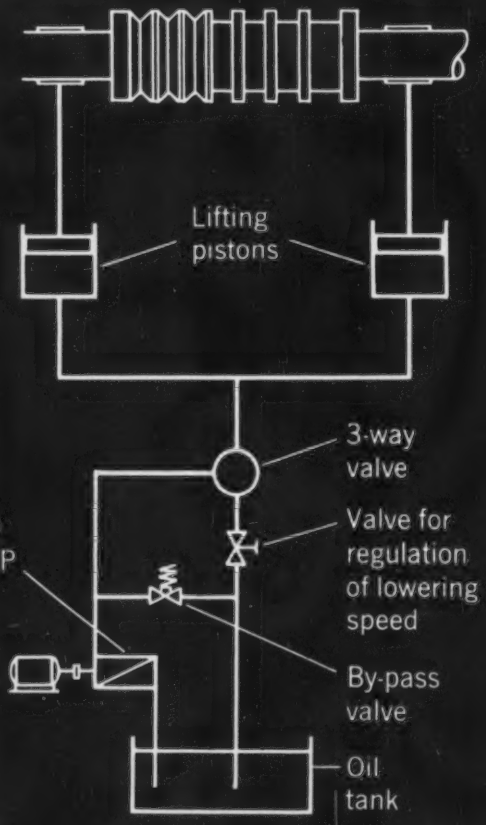
The IMO Pump has only 3 moving parts



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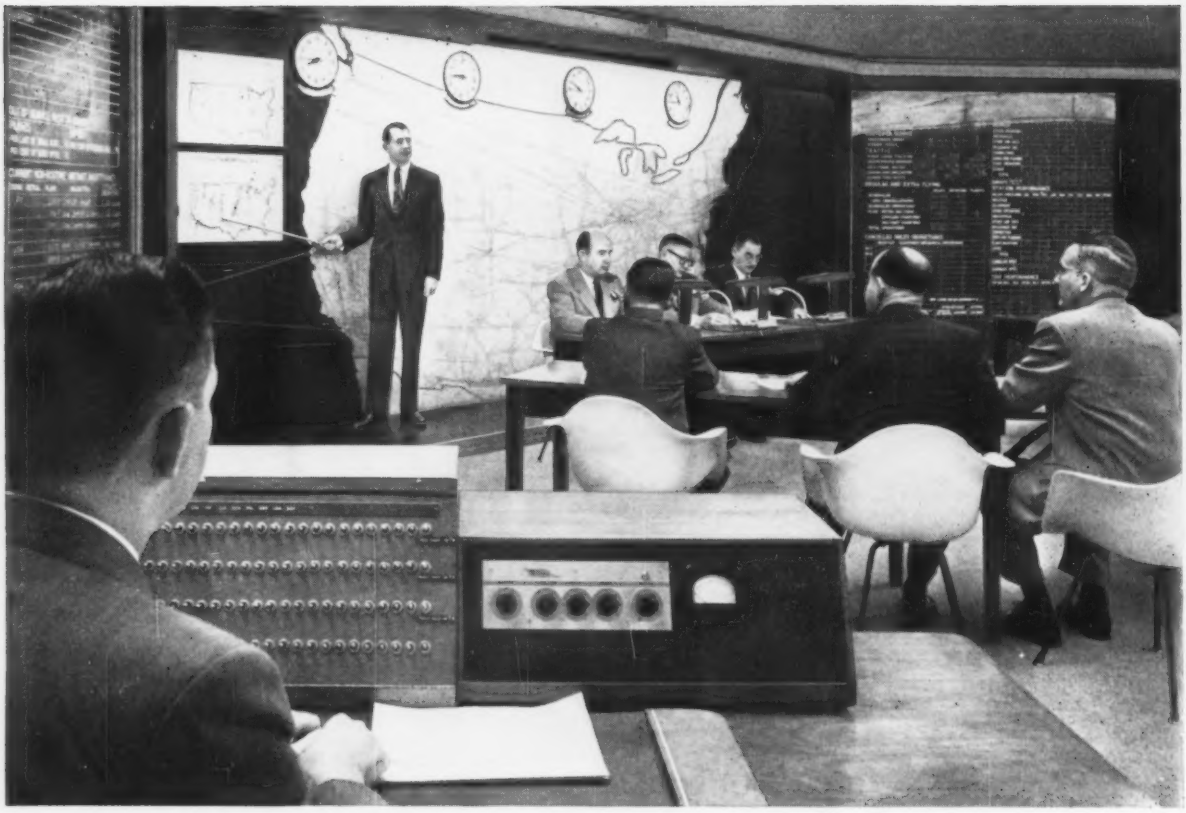

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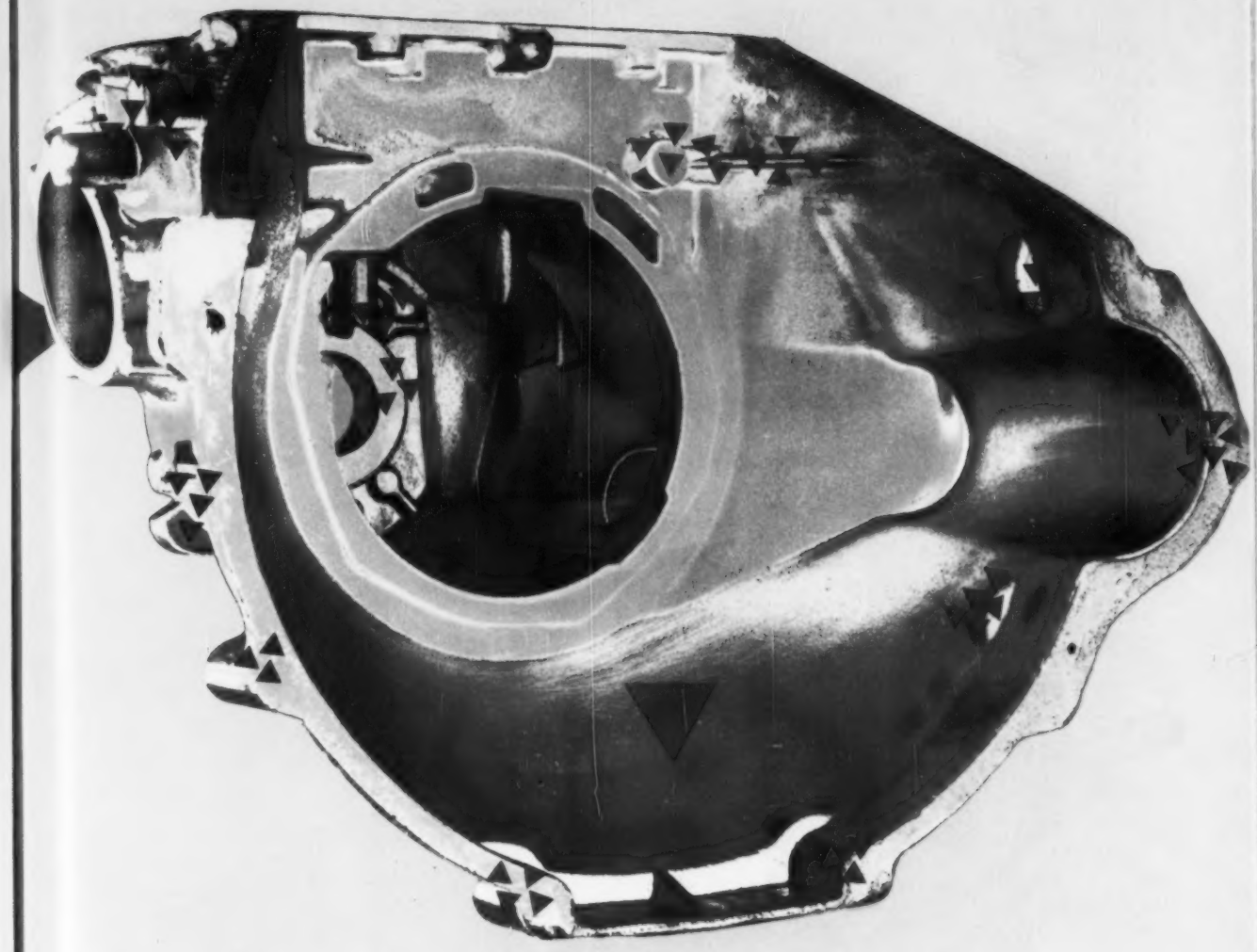

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The design areas in this permanent-mold casting are pegged in red. The part itself is an automatic transmission housing for the '59 Ford car. It weighs 24 lb, 61 lb less than its cast-iron predecessor. The cyclone forces that whirl through modern automatic transmissions bring stress ranges in some parts of the casting up to 21,000 psi. The problem was to provide adequate strength without unnecessary weight in the casting walls.

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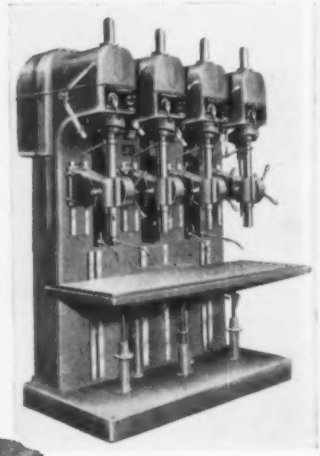

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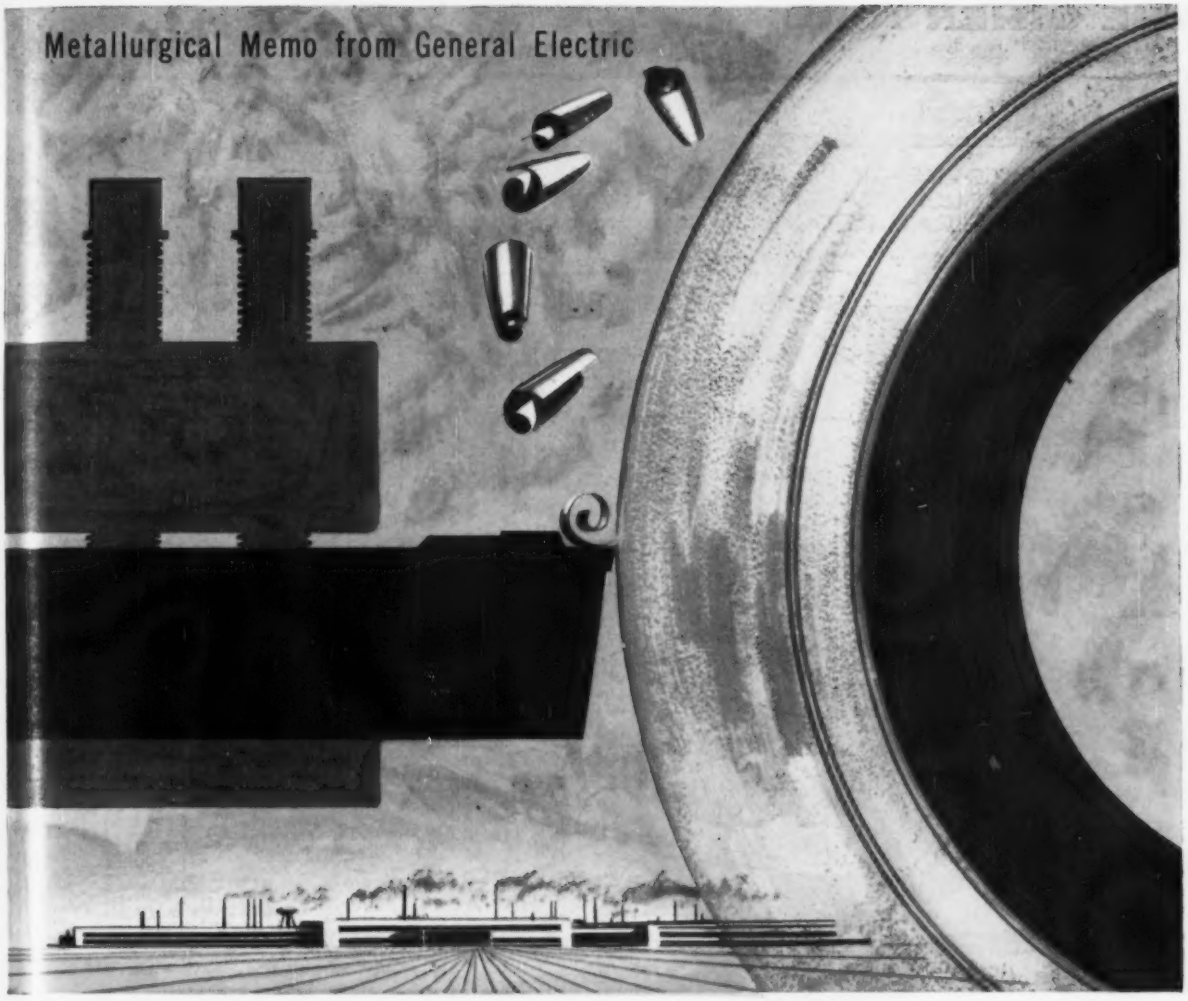

Why 242 different toolholders?

Metallurgical Products Department reports on an expanded new line of Lift-O-Matic toolholders . . . 242 sizes to speed changeovers on every job

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YEH? THAT'S THE SEVENTH ONE HE'S USED ON THIS HEAT---AND HE STILL DON'T BELIEVE IT.
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STEEL EQUIPMENT BOOM, reported as likely by The IRON AGE two months ago, is here. It is coming in with a bang, with well over $1 billion already appropriated for new mills, more efficient machinery and equipment.

NATIONWIDE CAPITAL SPENDING BREAKOUT could be in the making. Signs are starting to crop up in quite a few areas. Witness the $13.3 million in net new orders for industrial furnaces in April. This was a rise of 117 pct over March, says Industrial Heating Equipment Assn. January-April orders of $25.7 million were 95 pct better than same period in 1958.

PRICE STABILITY could be coming to an end, say Washington economists. Upward pressures are in the making, both in industrial prices and consumer prices. Steel price rise effect would be far-reaching.

SURPLUS GOVERNMENT PROPERTY worth $10 to $12 billion will go on sale in the 12 months starting July 1. Most of it is military. But 35 pct is civilian, such as office furniture and equipment.

PLASTICS' BIG PUSH in automotive field is underway. Du Pont is aiming for automotive applications now held by conventional diecasting materials. Du Pont predicts its new plastic material, "Delrin", will save the auto industry some $45 million over the next five years.

ALUMINUM HUBCAPS have won out over stainless steel for use on 1960 models of one of the low-priced three autos. Chief reason: Economy. Deluxe wheelcovers may continue to be made of stainless.

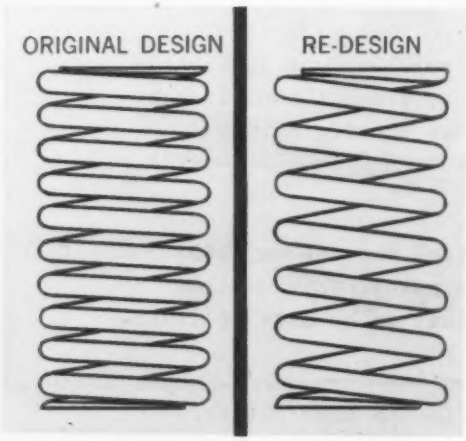
ALUMINUM IMPORT HEADACHE may ease considerably in the near future. That's the thinking of Frank Nichols, president, Nichols Wire and Aluminum Co. Just back from a European tour, Mr. Nichols feels the pressure will ease as Europe uses more of its own metal.

SMOKE CONTROL EQUIPMENT makers will lend a close ear to discussion of proposed revision of Pittsburgh's smoke control law. There's a chance the new ordinance will set limits for smoke from openhearth furnaces. That would mean equipment buying rise.

NATIONAL OUTPUT RISE to record heights is proof of the pudding. The economy is gaining strength from many sources. Output of goods and services hit a record annual rate of $467 billion in first quarter, Commerce Dept. reports.

70 POUNDS OF SPRINGS

were just going along for the ride!



10 coils—.120″ wire
130 lbs. of wire per
1M springs

7 coils—.105″ wire
60 lbs. of wire per
1M springs

Because of mounting cost conditions, a user of motor-support springs asked for a complete design check. Redesigned by A.S.C. engineers, required stresses were met by a slight change in wire size, allowing a reduction in number of coils from 10 to 7. This meant a saving of 70 pounds of material per thousand springs. Because of the shorter length of wire, coiling and grinding speeds were increased, heat-treating time reduced. Saving to the customer—40%.

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How Industry Plans for Defense

Explosive technology has taken defense business away from the assembly line.

Here is how several leading companies organized and planned to keep active in defense.—By R. D. Raddant.

▪ In spite of a Defense budget that is growing at more than $1 billion a year, a profitable defense contract is an elusive thing.

Because of what Defense Secretary Neil McElroy calls the "explosive progress" in military technology, new weapons are becoming more and more complex and with an accelerating rate of obsolescence.

Less Production — This means that companies with great mass production records are no longer the defense giants. And companies that want to stay in the defense business have to take a hard look at the potential, then organize to get it.

Because of the emphasis on missiles, aircraft and electronics companies have had the inside track and have taken the lead in overall defense business. But it goes beyond the missiles. Communications, both global and astral, have developed into major programs. Computers are a major element as complex masses of data have to be translated into immediate plans of action.

Everything Researched — The launching systems and sites for missiles, ranging from the Nike group through the coming ICBM's, have become a field of major scope. With the changing concept of what will be asked of ground forces, even the vehicles of the Army have become research projects.

Says Philco Corp.'s Henry F. Argento, vice president and general manager of the Government and Industrial Div.:

"We can no longer win a war by weight of numbers. Every man has to have greater capability than ever before. In World War II, emphasis was primarily on production. Today the weight is on research, develop-

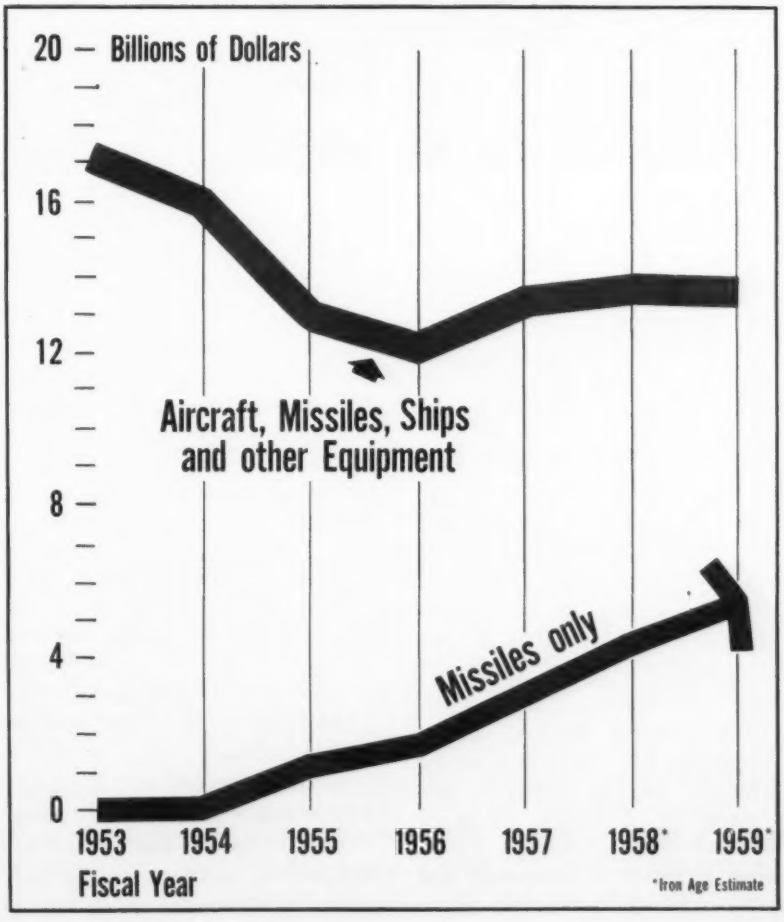
NEXT WEEK:

Challenge in Space

The second part of this series on changing concepts of defense will deal with the specific problems of aircraft and missile makers.

Missiles Take a Larger Share

Less Remains for Other Defense Items



"This race belongs to those who have the skills. It is moving fast and will move faster." Philco's Argento.

ment, and engineering."

Plans at Philco—Philco, which jumped from 46th to 38th among the top defense contractors last year, is one of the companies which believes its capabilities should bring in a greater share of defense contracts.

"This race really belongs to those who have the skills," Mr. Argento says. "It is moving tremendously fast and it is going to move even faster. We have the capability in research, engineering and manufacturing. We are going to use these capabilities to improve our defense business."

Too Fast for Humans—Philco is well into the missile field (prime contractor for the Sidewinder, for example) and is active in all phases of electronics. It also has a big defense potential in computers and data processing equipment.

Computers like the Transac S-2000 (above) will be of growing importance in defense.

"Things are happening too fast and are too complicated for the individual to handle," Mr. Argento points out. "We need these systems of data processing to give immediate answers to scientific and industrial problems as well as in defense networks."

Astral Communications — Mr. Argento points out that the problem of transferring information has become a major effort, says Philco is active in astral and global communications systems and missile guidance.

As an illustration of the magnitude of communications in modern defense, Philco has just received an $18 million contract for the first phase of Operation Quick-Fix, a giant program to modernize the Air Force's communications system. No final figures are available, but outside estimates indicate the entire job may run into $100 million.

Like others in defense business and determined to stay there, Philco has stepped up its research, including basic research.

Team Effort at AMF—In view of the magnitude of individual defense projects and weapon systems, very few companies are able to go after an entire program on their own. This has led to the development of "teams," where several companies will pool their resources to go after a project.

American Machine & Foundry is a company that took a long, hard look at its defense program. Fred K. Powell, Jr., vice president of AMF and group executive, Government Products Group, explains the thinking this way:

Expensive Proposal—"Some proposals alone on large systems contracts cost more than $1 million. For a company doing from $40 million to $50 million a year on defense business, it was simply not practical to compete alone with the much larger companies. We therefore came to the conclusion that the team effort was the best way to bid."

A good example of the team effort is the Dyna-Soar program in which AMF is a member of the Martin team, one of the two picked by the Air Force to carry out preliminary research and development work on the program.

Should Pay—"If the Martin team is the one finally chosen by the Air Force, we will, in cooperation with the other team members, carry out the work involved and should make a reasonable return on our investment in the project," Mr. Powell says.

AMF has a wide range of defense work. One major project includes contracts of $42 million for development of the Titan underground launching system.

"Another change in the defense

business picture is the shift from quantity production to increased emphasis on research and development work in small production runs," Mr. Powell points out. "The technical requirements on defense production are up and quantity production is down. Companies that manufacture in defense business must now be prepared to do R & D."

Most executives agree that R & D, and engineering must be done at a reasonable return.

"In the past, we operated engineering as an aid to production and just tried to break even. With more emphasis on R & D in comparison with production, there is more of a need to make a reasonable return on your investment in this part of defense work," Mr. Powell says.

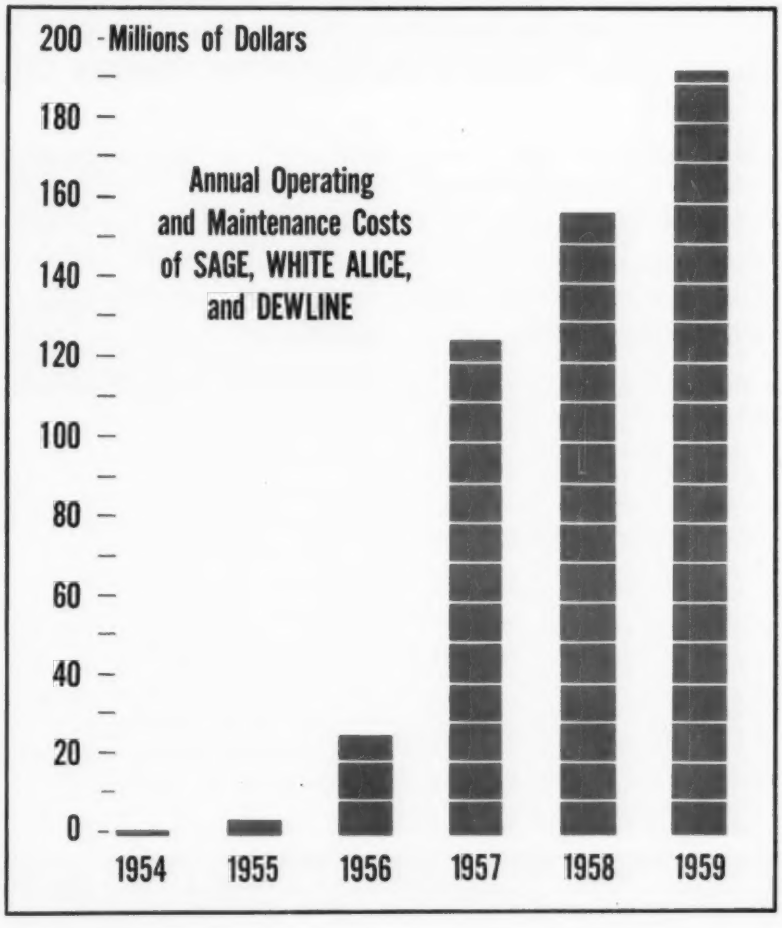
Automotive Problems — Out in Detroit, the Chrysler Corp. serves as a good example of what is happening among the automakers in their approach to defense work. In the days when their mass production skills could be applied to aircraft as well as the vehicle in defense, automakers were the giants in defense. Now, they are regrouping to keep in the picture.

Ford has its own Aeronautics Systems, Inc., a West Coast subsidiary which is contractor on the Shillelagh missile. GM is reorganizing its defense activities, probably will concentrate in electronics. Chrysler's defense business, a $300 million backlog, is divided between the Jupiter missile and other defense contracts. Defense hit about 15 pct of its 1958 dollar sales.

Need New Vehicles—Chrysler's Defense Operations Div., under William S. Blakeslee, includes the company's defense engineering and manufacturing, but not missiles. Its primary product is the M 48 medium tank, but much of its effort is directed toward new defense products.

Although a greater part of the defense dollar will continue to go for missiles, Mr. Blakeslee is convinced that there is other great potential in defense. It lies in development of new vehicles that will do more at less cost than present vehicles and in vehicles completely new in concept that perform a needed function.

The High Cost of Staying Alert



In to Stay—"This is a permanent division and is expected to continue in business," Mr. Blakeslee says with conviction. "As has been the case for years, what the military is after is greater mobility, greater fire power, and more reliability. To devise and develop these products is the purpose and function of our division."

The medium tank continues to be the division's major field, and 900 M 48's are on order. The company also is the design agency for the M 60 new medium tank and is negotiating for the first production order.

Even in what was once a basic production area, research and development are gaining in importance. Some products under development by Chrysler are an aerial research vehicle, an assault ferry, and an aluminum truck which floats.

Planned Obsolescence? — Mr. Blakeslee points to the assault ferry as an example of what his division hopes to accomplish. On reaching a water barrier, four vehicles, manned by a total of eight men, will be able to ferry tanks and other vehicles and personnel in 20 minutes, something that now takes 60 men two hours to accomplish.

"This goes beyond mere upgrading of present equipment and represents progress. If it can do the job with time and man-hours saved, there will be a demand for it."

Did Ike Help McDonald's Cause?

Steel Labor Chief's 'Social Visit' Raises Questions

Dave McDonald may have scored on management with his visit to the White House.

But union and management are still miles away from a new contract.—By Tom Campbell.

1959's Union-Management Crisis

■ The steel labor hassle became crazier than ever last week. With the steel negotiators—led by U. S. Steel's R. Conrad Cooper—putting up an extreme cold front, Dave McDonald pulled a rabbit from the hat.

Making a bid for prestige in the midst of rank and file anger over a possible steel strike, Dave identified himself as a "good and old friend" of the President of the United States.

Just a Chat — Fulfilling a date with Ike, which Dave asked for some weeks ago, the steel labor chief stole a march in the battle of words—and public relations.

He spent half an hour with the President and professed to talk about nothing but what a friendly call would entail. No talk about the steel labor hassle, said Dave. And no talk about inflation, he said, with a straight face. Talk of world affairs? Yes.

"SOCIAL VISIT": After his "social call" on the President, Dave McDonald, steel labor chief, gives out with a hearty laugh at post-meeting press conference. Ike's press secretary James Haggerty is in foreground.

Management Unfazed—But those on the inside of the steel situation swore that no matter what the events of last week did from a public relations standpoint for the union there would be no budging of the steel negotiators. In fact it was clear that the steel industry is not going to offer anything except polite attention to what the union has to say at the secret meetings.

Unknown to many last week, the steel industry had eliminated from its lexicon the word "fringe." Reason: It has become so great a part of the wage costs. It is clear that no matter what the steel union has to say about wage and "fringe" increases, the steel firms will put it through the IBM machine and get the "true" total wage costs.

Still Miles Apart—This state of thinking dooms all the reports and speculation that the steel industry would listen with a kind ear to "things other than a wage increase of so much an hour." To the hard steel heads at the bargaining table, anything that raises wage costs is out of the question.

Last week it was clear that Dave McDonald was aware of the wide gap between him and the steel negotiators. So much so that only with the greatest of restraint was he able to be courteous at the sterile press conferences.

Here's Why—But the President has muddied the waters even more than he had a few weeks ago. He made it plain then that he wanted no steel price increase. To the steel industry that meant that there could be no wage increase.

In the opinion of The IRON AGE it will take a long strike, tremendous pressure, and an unusual turn of events to bring even a moderate wage boost. And if that

happens—and there is this week no indication it will—there will be a price increase with the blame on someone besides the steel industry.

Dave on Defensive — Reports were circulating last week that a steel settlement "was in the bag." Run down, they proved to be more wishful thinking. The steel union has never in recent years been on the defensive so much and so often.

Dave has even disturbed the press by insisting repeatedly that he cannot negotiate publicly. Never before has the steel union been so blunt with the press, where in fact, the negotiating is being done.

But Steel Loses a Round—The steel management side suffered a setback with the President of the United States taking one half hour out of a busy day to talk to Mr. McDonald. It may be forgotten by many in the steel industry that Mr. Eisenhower is in fact a good friend to Dave McDonald and has a good opinion of him. This opinion has been held by Ike for some time.

By inference, the President — and his advisers—have said that wages must not go up to the extent that inflation will result. But the identification of Dave with Ike is bound to impress the public. That is probably exactly what Dave intended when he asked for the audience —considered to be a prime and smart public relations move.

It's Industry's Turn—It was all the more significant because the President knew exactly what he was doing when he agreed to a "social visit" with Dave. It is now up to the steel industry to pull something from its bag in the coming weeks.

But the thing that makes it even more "zaney" as the steel meetings lead down the track to a probable shutdown is the side remarks of the President's advisers. Dr. Saulnier, the President's chief economic adviser, has gone on record that a wage increase would probably be inflationary because it would set a pattern for other unions and would force up prices in other areas.

U.S. Surplus Sales

Methods Irk Used Tool Dealers

▪ Used machinery dealers are hot under the collar about government methods of selling surplus equipment.

They are concerned about the potential amount of U. S.-owned machine tools which could pour onto the market. But they are even more disturbed about present disposal procedures. (See box below.)

Resolution Passed—This concern erupted last week as the members of the Machinery Dealers National Association got together for their annual meeting in New York City.

The result: Agreement the MDNA should investigate, through legal counsel, the legality of government surplus disposal procedures. If study shows these practices are incorrectly conducted the Association will press for corrective action.

Things To Come—From a government official, Harry Hawkins, Business and Defense Services Administration, the dealers heard disquieting news about future disposal.

The three military services now own about 287,000 machines and other industrial gear within the continental U. S., Mr. Hawkins noted. Of this equipment about 80 pct is 10 or more years old. Some machines are 15 to 18 years old.

There is little hope the tempo of surplus disposal will slow down in coming years, Mr. Hawkins warned. Meanwhile, he added, the U. S. is anxious to minimize its adverse impact on tool builders, distributors, and re-sellers.

Important Cog—The used machinery dealers are an important outlet for surplus government-owned tools, Mr. Hawkins pointed out. Studies of initial government sales during the last year and a half show dealers bought about 35 pct of the items offered. About 11 pct was purchased by manufacturers and other end users.

Dealer Views on U.S. Sales

Why Dealers Object — Government sales of excess equipment, according to used machinery dealers, are not always conducted correctly. Basically here's what they are concerned about:

By-passing Trade Channels — As now handled, U. S. surplus disposal sometimes by-passes "the normal channels of trade" (i.e.— the dealers).

Lack of Restraint—By not disposing of equipment under "orderly methods" government action can glut the market with a disastrous effect on price levels.

Disappearing Equipment — In some cases, the military asks for sealed bids on equipment. Dealers show interest, enter bids. Then the items are withdrawn from sale.

Bid Bond System Defects—There is no uniformity in the government's bid bond system. This is the method of requiring performance bonds from buyers at sales. In some cases, 20 pct is asked, the dealers say. In others, it's only 10 pct. And in some instance a bond is not required.

Some Mills Would Escape Strike

But the Shutdown Would Be More Complete Than in '56

As usual, steel labor can't or won't strike some mills. But the list has been shortened.

Kaiser Steel, which was spared in '56, has a contract that expires at the same time as other major producers.

■ If steel labor strikes the mills this year, the shutdown probably will be more complete than was the case in 1956.

Reasons for this include:

1. More mills have June 30 contract expiration dates. Best example: Kaiser Steel Corp., which in 1956 had a contract that expired one month after that of most other producers. It operated during the 34-day strike.

2. There is less certainty that steel labor will honor contract extensions even if they are given at the outset of a strike. "If there is a bitter strike, we'll probably be closed," says one mill that operated last time.

Some mills are certain to operate regardless of a strike's duration. Others will escape at the outset, but if the strike is a long one they're almost certain to be hit. A few companies may operate at the sufferance of the union, especially if the mill's financial structure is shaky.

Who's Not Organized—Weirton Steel Co., a division of National Steel Corp., was one of the few companies which successfully resisted organization by the United Steelworkers. It deals with an independent union which has never struck the company. With a capacity of 3.3 million tons, it is the largest company in no danger of a shutdown. (See list below.)

The Butler, Middletown, and Zanesville plants of Armco Steel Corp., also are not organized by the USW. The Butler and Middletown plants have a combined capacity of more than 3 million ingot tons.

Special Deals — Granite City Steel Co., with a capacity of 1.4 million tons, has a contract that runs out on June 30, but it has remained open by special agreement in the past.

In 1956, McLouth Steel Corp., operated under a contract extension, but whether such an arrangement could be worked out this time is problematical. Says Robert McLaughlin, vice president:

Big Question—"The question of whether we would continue to operate past the contract deadline hasn't come up yet. Even so, our situation has changed since the last contract. For one thing, we're a lot bigger now than we were then. We're now the 12th largest steel company whereas we were 20th in 1956."

These Mills Would Be Spared

COMPANY	ANNUAL CAP. (net tons)	STATUS
Armco Steel Corp.		
Butler, Pa.	557,000	Independent union
Middletown, Ohio	2,557,000	Independent union
Zanesville, Ohio	—	
A. M. Byers Co.	90,000	July 31 expiration
Colonial Steel Co.	30,000	July 31 expiration
Vanadium Alloys Steel Co.	12,000	No union
Weirton Steel Co.	3,300,000	Independent union
Midvale-Heppenstall Co.	157,700	Not organized by USW
Empire-Reeves Steel Co.	500,000	Sept. 1 expiration
Latrobe Steel Co.	24,000	July 31 expiration
H. K. Porter Co., Inc.		
Connor Steel Div.		
Birmingham	115,000	Sept. 30 expiration
Huntington, West Va.	110,000	1960 expiration
Vulcan-Kidd Steel Div.	9,600	Aug. 15 expiration
Southern Electric Steel Co.,		
Birmingham, Ala.	66,000	Responsible in August on wages only
Kilby Steel Co.,		
Anniston, Ala.	34,000	September expiration
Alan Wood Steel Co.	800,000	July 31 expiration
Carpenter Steel Co.	87,500	
Reading, Pa.	—	No union
Bridgeport, Conn.	—	July 31 expiration
Lukens Steel Co.	930,000	July 31 expiration
Continental Steel Corp.	420,000	July 31 expiration
Wisconsin Steel (International Harvester)	1,200,000	July 31 expiration
Keystone Steel & Wire	457,000	Feb. 1960 expiration
Lone Star Steel Co.	800,000	Sept. 7 expiration.

Aluminum Imports Will Drop, Says Nichols

▪ U. S. aluminum sellers suffering from headaches caused by foreign metal moving into domestic markets ought to be feeling a lot better soon.

European producers will sharply increase deliveries to their home markets and send less here in the very near future.

That's what Frank Nichols, president of Nichols Wire & Aluminum Co. told The IRON AGE in an exclusive interview late last week. He called the current problem of imports a "temporary phenomenon."

Expansion of Markets—Mr. Nichols, just returned from a seven-week tour of European industrial centers, reports Europe is now suffering a slight recession, probably a delayed reaction to the American slump. But the unquestioned trend is for substantial expansion of European industry and markets.

"Europe's real problem will soon be an aluminum shortage, not a surplus." Some countries now exporting have already been forced to import metal for home consumption. And deliveries are becoming impractically long. A British firm, seeking Yugoslav aluminum discs, was told delivery could not be made until September.

Price is the main attraction of European aluminum to American buyers. But there are other considerations. Some European mills offer sheet finishes as standard which would cost extra here, Mr. Nichols reports.

European producers may be cutting things too thin. They now risk U. S. quotas or tariff boosts. Also, European mills often pay heavy fringe labor costs. And Continental labor is restive.

Good Quality—Production quality is high overseas, says Nichols. Plants are usually geared to shorter runs and smaller quantities, and often display high inventiveness in producing a large number of products from a limited range of equipment.

VERTICAL HANDLING: At A. C. Leslie & Co., Ltd., Toronto, a Trak-Rak System of vertical storage and handling is in operation. This type of setup is being installed in at least five U. S. service centers.

New Storage Trend

▪ Steel service centers are cutting their steel storage costs by going straight up. One warehouseman reports he now stacks his steel to heights of 22 ft., uses a stacking crane to put it there. He stores as much steel in 8400 sq ft as he formerly stored in 15,000 sq ft.

W. P. Carr told American Steel Warehouse Association members at Chicago that A. C. Leslie, a Toronto steel distributor, has shown a 35 pct capital cost savings by storing steel upward, not outward, in its new plants.

Combination Clicks — The firm stacks its inventories of steel to heights of 16 ft. Through addition of a Chicago Tramrail stacking crane, the Canadian firm has cut labor costs 50 pct in handling, packing, weighing, and shipping.

The high storage-stacking crane combination is credited with cutting order processing time by one-third.

Crane Details — The stacking crane, a telescoping lifting device with both crane and crane operator suspended from an overhead track running down the center of each inventory aisle, allows inventory storage in narrow, high aisles. The crane will carry a 4-ton load of steel down a 45-in.-wide aisle at 75 fpm under one-man operation.

E. Hawkridge, Hawkridge Brothers Company, reports that installation of an American Monorail stacking crane, used in a steel service center with 12 ft racks, has cut order filling time to three manhours per ton of steel shipped to customers.

Battle Rages at Ogden Dunes

Both Sides Wheel Out Heavy Legal Artillery

Three steelmakers own land in the area. National and Inland would like to build.

But the town moves to keep them out.—By K. W. Bennett.

▪ The skirmish at Ogden Dunes may flare into a full-scale war. The key decision will be made this week by a Federal court.

The controversy is over 3000 to 4000 acres of real estate on the last 3.5 miles of lake front on the southern tip of Lake Michigan. Three steel companies (National, Inland and Bethlehem) own land there, and at least two of them want to put up mills. But some citizens in the town Ogden Dunes want to be left alone.

Which Court Counts—If Federal court accepts jurisdiction the case could drag on for years, say observers. And Ogden Dunes feels it would have a better chance than in a State court.

On May 5, Ogden Dunes fired the first salvo. A recent Indiana law permits a town or village to annex property as much as two miles outside existing boundaries if it isn't zoned. The disputed area is not zoned.

Ogden Dunes went through the legal motions on National Steel's 800 acres. But when they came to Inland Steel's 275 acres the steelmaker was ready. Inland got a restraining order from Superior Court Judge J. A. Fleishbein.

This also protects Bethlehem Steel's 3000 acres which would have been vulnerable with Ogden Dunes' new boundaries.

Here's the Rub—Apparently the dispute centers around the legal definition of the word "promulgated." The law under which Ogden Dunes acted was passed only recently and will not be promulgated until next month. The question is, "Is a law binding when it is passed, or not until it is promulgated?"

(Webster's dictionary, hardly an authority in this case, says "promulgation of a law is the executive act by which a valid law is put into force after being passed.")

At the Same Time—Meanwhile, the county planning commission will meet next week to decide whether to recommend zoning the area for commerce and industry.

Observers are saying the commission favors letting the steel companies in but will probably recommend some pretty stiff clauses in the zoning rules for the area.

Ready to Fight—Also, standing by in the wings is the community of Portage. Sentiment there favors building steel mills. But the town is unincorporated and so can't act under the annexation law. Portage now plans to incorporate and apparently will contest Ogden Dunes' right to the land if the other town should win in court.

Helping to give the case some national attention, Sen. Paul Douglas (D., Ill.) began hearings on S. 1001, a bill to create a national park, not over 5000 acres, in the area.

Indiana's governor appeared against the Douglas bill. And University of Chicago professor Harold Mayer pointed out that the steel mills could just as easily be erected on fill in Calumet Harbor or Lake Calumet.

Battle of Ogden Dunes:

Steel Strongholds Are Being Stormed

Opposed:

Ogden Dunes — population calculated at about 900 to 950, is trying to annex its immediate surroundings to block industrial encroachment.

Sen. Paul Douglas (D., Ill.) is seeking to make a national park of the area being sought for steel development.

In Favor:

Portage Township is seeking to incorporate for its own reasons. As a village Portage would favor steel development.

Inland Steel Corp. has owned 275 acres in Porter County for 30 years.

National Steel Corp. owns 800 acres that has been annexed by Ogden Dunes. Company plans to produce tinplate, galvanized, hot and cold rolled sheet from semi-finished ingot from Great Lakes Steel Co.

Bethlehem Steel Co. holds over 3800 acres in Porter and adjoining township. Company hasn't spoken yet, but industry observers figure they're planning a 2 million ton steel plant there in the future.

Porter County will zone the area. Officials are generally thought to favor steel.

Why Smoke Worries Steel Industry

An Old Problem—The problem of controlling smoke and other waste emission from steelmaking and ironmaking furnaces has been with the steel industry a long time.

The experts have been working on it for years, particularly since the passage of smoke control laws by various communities throughout the country.

It Will Get Worse—It's likely that the problem will become more acute in the years ahead. For the mills, it's not only the job of controlling smoke emission, but the cost of installing the necessary equipment.

As of now, some 44 openhearth furnaces are equipped with cleaning systems. But 875 are not. And the cost per furnace of a cleaning system is $500,000 for a basic installation, and $1 million if waste heat boilers are not available.

A Big Bill—Estimated cost of equipping all furnaces not now so equipped: $400 million to $800 million.

U. S. Steel Corp. has thus far equipped 34 furnaces. They include 4 at Torrance, 10 at Geneva, 9 at Fairless, 10 at Homestead, 1 at Edgar Thomson (wet washer). Kaiser Steel has 9 at Fontana. J. & L. has installed 1 at Pittsburgh, with more to come.

Smoke Control Poses Problems

Revision of Pittsburgh's smoke control law may force mills into costly equipment program.

The situation is symptomatic of a national move to make cities cleaner.—By G. J. McManus.

▪ The problem of smoke may soon become a costly headache at one large steel making center.

Pittsburgh's smoke control code is up for revision June 1. According to one authority, there is a good chance the new ordinance may prescribe limits for smoke emission by openhearths.

It's Expensive—What this could mean in the way of cost is shown by the smoke control program of Jones & Laughlin Steel Corp. J&L is putting electrostatic precipitators on its 11-furnace No. 4 shop at Pittsburgh. Cost will be about $9 million.

There are close to 200 openhearths in and around Pittsburgh. U. S. Steel is now breaking in precipitators for 10 openhearths at Homestead Works. The Corporation has a wet washer on an openhearth at Edgar Thomson Works. J&L has one precipitator now and a new system planned for Pittsburgh.

Big Job Ahead—That leaves over 150 openhearths still to be smog proofed. For each furnace the cost would run $500,000 to $1 million, depending on the availability of waste heat boilers.

Not even the most ardent clean air advocates are suggesting the job be done overnight. However, the time limits being discussed do not allow for much delay.

A National Problem—While Pittsburgh is particularly touchy about smoke, pressure for cleanup is nationwide. Los Angeles forbids visible particulate matter in excess of No. 2 on a Ringleman chart. This standard has been called impossible for industrial operations but it has been adopted in a number of communities. In Gary, Ind., a candidate for Council is basing his campaign on a promise to clean up the city.

If rigid smake control is applied in all steel centers, the cost will be astronomical. Only 45 out of the nation's 920 openhearths now have precipitators or wet washers. To clean up all furnaces would cost over a half billion dollars.

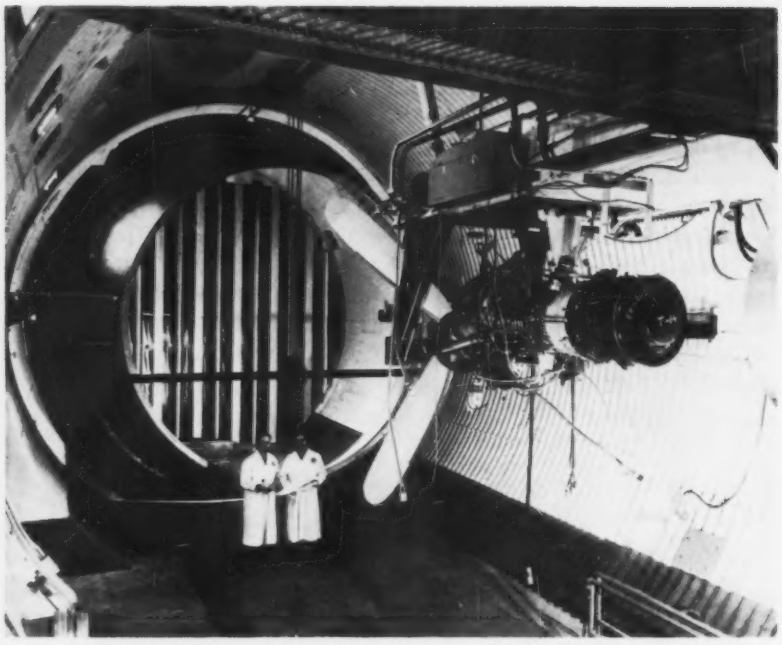
Strictly Good Will—For the mills any money spent to curb openhearth smoke is strictly good will. Flue dust caught by blast furnace cleaners can be sintered and recharged. Openhearth systems yield no return.

Moreover, say the mills, there is no assurance that expensive precipitators will eliminate criticism. A system can pull out 90 pct of the particles discharged by an openhearth and still put out a flume that draws complaints.

Uncertain Art—Finally, the business of controlling smoke is still an uncertain art, insist some. What works in one plant may not in another.

In part the problem may be solved by natural attrition. A study a few years ago showed that 700 of the nation's 900 openhearths were rated at less than 225 tons. A considerable number of the smaller and older openhearths will be retired in the near future; plans for replacing at least three shops with oxygen vessels are being considered.

Testing New GE Turboprop



TURBO: The military wanted an aircraft engine both powerful and very economical on fuel. General Electric's answer is the T64 Turboprop/Turboshaft. Gearing and accessories can be added to the basic power unit to make either. Here the Turboprop version is tested in part of the one million dollars worth of test facilities built by GE's Small Aircraft Engine Dept. for the project. The engine will be in production soon.

House Passes a Tough Renegotiation Bill

Defense contractors and the Administration couldn't stunt congressional support for a tough renegotiation law. (The IRON AGE, May 7, 1959, P. 53.)

The powerful House Ways and Means Committee formally approved a four-year extension of the act, designed to permit the government to recover "excessive" profits on defense contracts and subcontracts. Contractors wanted only a one year extension past the present cutoff date of June 30; the Administration had asked for a 27-month extension.

The bill was passed by the House.

Criticism of earning levels of the major aircraft companies which make almost all their income from the government and use large amounts of government-owned production facilities probably helped touch off the long extension. Congressmen such as Rep. Carl Vinson (D., Ga.), chairman of the House Armed Services Committee, complain that even under renegotiation, aircraft company profits when measured against the amount of their own investments are extremely high.

It's Softer—The Ways and Means Committee softened the present law slightly in its proposed extension. But it rejected industry bids to have more contracts exempted from renegotiation and to permit higher levels of profits generally in order to spur plant modernization and expansion by contractors.

Under the bill approved by the Committee, the U. S. Court of Appeals could review renegotiated contracts on appeal from rulings of The U. S. Tax Court. The appeals court could only uphold the Tax Court or send the case back for further study.

New Provisions—In addition, the Renegotiation Board would be required to give contractors a statement of the various factors considered by the Board in making its determination of unreasonable profits. Also, for the first time the Board would be required to give the defense contractor all reports it received from any government agency before issuing a final order and required repayments to the government.

Republic Expansion

Republic Steel Corp. won't stop with the $45 million it will put in new facilities at its Warren, O., plant (The IRON AGE, May 14, P. 114). T. F. Patton, company president, told stockholders at the annual meeting, in Flemington, N. J., that Republic would go for $375 million for capital improvements.

No new plants are planned. Projects totalling $185 million have already been approved.

Republic will spend about $55 million of the total this year, $110 million in 1960, $84 million in 1961, $60 million in 1962, and the balance in 1963.

Long Ore Carrier

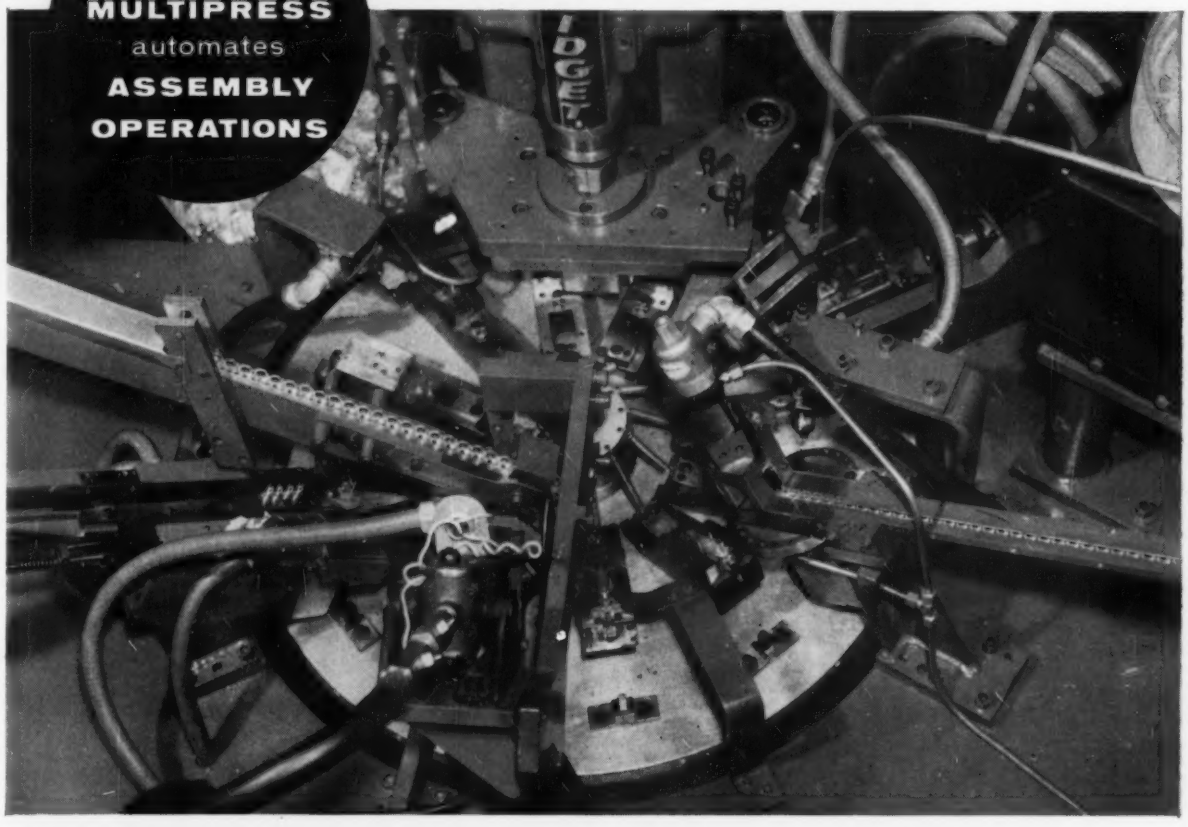
American Shipbuilding Co.'s Toledo yard recently completed one of the longest ore carriers on the Great Lakes and St. Lawrence Seaway. The S. S. Shenango II cost the Shenango Furnace Co., Cleveland, $8 million. It is 710 ft long, will carry 25,000 tons of ore at about 16.5 mph.

SUB Legal in Ohio

Supplementary Unemployment Benefit payments are now legal in Ohio. Gov. Michael V. DiSalle has signed an emergency law which releases $25 million in back payments to workers who had been unemployed. The action came after the Ohio Information Committee withdrew its opposition to SUB after four years. Payments will amount to about $23 per week for the time workers were unemployed.

How **DENISON MULTIPRESS** automates **ASSEMBLY OPERATIONS**

45 assemblies-per-minute *are produced on this 1-ton Denison hydraulic Multipress and automatic index table at the Unique Balance Division, S. H. Pomeroy Company, Dubuque, Iowa.*



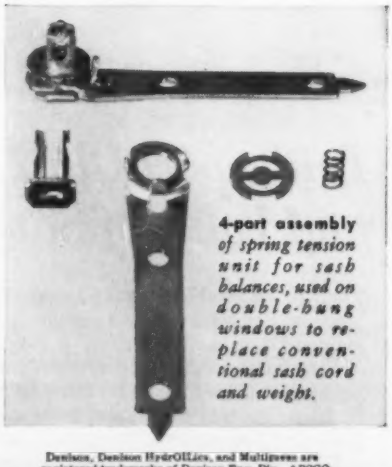
MULTIPRESS assembles and inspects complex 4-part components

...at a rate of 2700-per-hour

With this Denison hydraulic Multipress and feeding devices, production assembly of complex units has been increased and costs reduced considerably.

Completely automatic, the particular operation shown assembles and inspects the four-part assemblies at a rate of 45-per-minute...*2700-per-hour.* Any defective assemblies are automatically rejected. The operator has only to supervise the equipment and load component hoppers.

The automatic operation shown is typical of how multi-component assembly operations can be simplified with Denison hydraulic Multipress and simple tooling. The Denison field man near you can help analyze your work and demonstrate how you can duplicate these savings in your plant. Write for the Denison catalog describing the full line of Multipress units for your work.



4-part assembly *of spring tension unit for sash balances, used on double-hung windows to replace conventional sash cord and weight.*

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The striking good looks and incomparable durability of Samsonite luggage make it the most popular "traveling companion" in America. Part of Samsonite's beauty and strength comes from Bridgeport Ultra Fine Grain Brass strip; formed by stamping into the clasps, locks and handle sockets of Samsonite's "Streamlite" selection.

Ultra Fine Grain is exceedingly smooth after bending, forming or drawing and it can be quickly and economically buffed to a high luster at little cost in time and effort. Often, buffing alone is sufficient to meet end-use requirements.

In addition, you are offered specialized technical and engineering aid on any product or production problem that may confront you. Call your nearest Bridgeport Sales Office for immediate service.

Complete and fully descriptive information on Bridgeport Fine Grain Brass can be had in the brochure, "Grain Size, the 4th Dimension of Brass." A request to Dept. 3405 will bring you your copy.

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Strong, long lasting Bridgeport Ultra Fine Grain Strip forms these catches for Samsonite Luggage—keeps their natural beauty for the life of the luggage.

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James L. Daniell

A Tough Steel Sales Competitor

The new president of Green River Steel has piled up a formidable record.

In business, athletics, and civic life, he has a penchant for coming out on top.

▪ Hard-charging James L. Daniell, who broke through many a line in his college and professional football days, gets another letter for cracking the line in the steel market. He hit pay dirt this year for Green River Steel Corp., Owensboro, Ky.

Since he was named president of the Jessop Steel Co. subsidiary on Jan. 1, Green River has shown its first profitable quarter in two years. And apparently it's not just luck on Jim Daniell's part.

An All-American—He did pretty much the same thing for Alloy Manufacturing Co. where he was vice president, general manager, and sales manager before joining Jessop last year. He ramrodded Alloy's annual sales from $300,000 in 1946 to a peak of $4,500,000 in 1958.

Six feet, two inches tall and 240 pounds, Jim Daniell was an All-American tackle at Ohio State University in 1941. He later played pro football with the Chicago Bears and the Cleveland Browns.

Penchant for Sales—Like many another star athlete, he gravitated toward sales. Perhaps it's because good athletes usually develop some important basic sales traits: Agressiveness, the ability to think fast on one's feet, and an impressive appearance.

Atlhough he plays an important part in his company's overall operations Jim Daniell claims that "sales is really my line."

"I think that those who have participated in athletics are most desirable employees to industry," he explains. "They are accustomed to bitter competition and are prepared for it in business and in life itself."

JAMES L. DANIELL: (with son, left) Ready for tough competition.

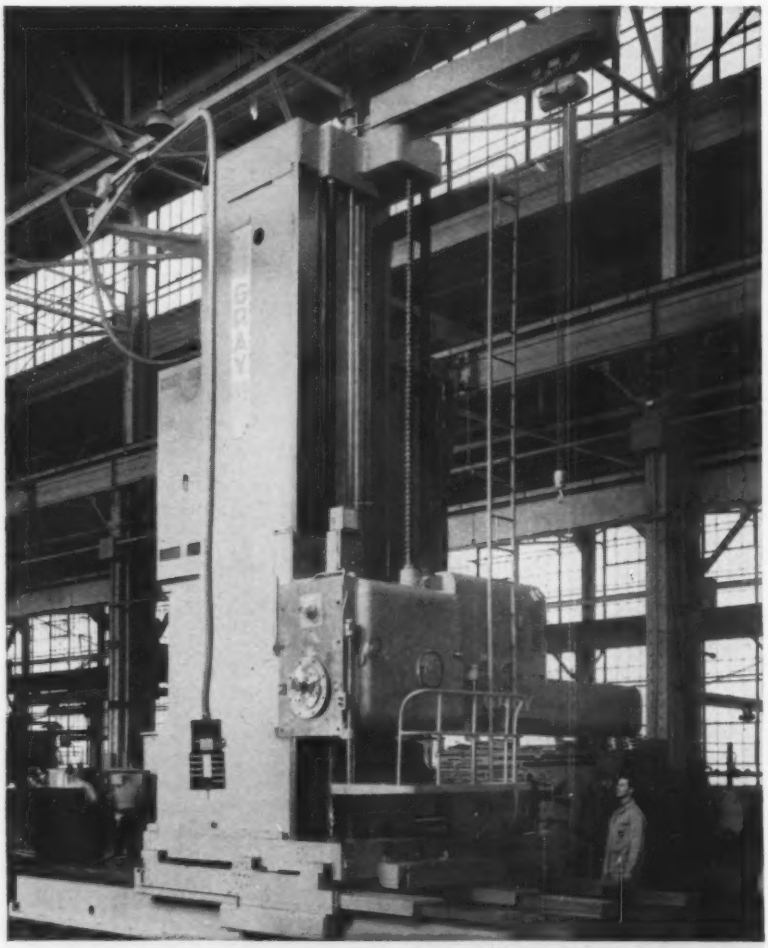
Working With Youth — At his home town, Mt. Lebanon, Pa., a suburb of Pittsburgh, Jim is helping prepare youngsters for the competitive years ahead by managing a baseball team in the local junior baseball association. He is founder of the Parent's Athletic Civic Council—a civic organization to help the town's young people find recreation in athletics. Among the beneficiaries of these efforts are his four children, ranging in age from three to 14 years.

Last year, Jim Daniell was elected to a six-year term as director on the Mt. Lebanon school board.

Holds Silver Star—While he has done exceptionally well in business, civic life, and in athletics, Jim Daniell also has a commendable war record. As a Navy enlisted man during World War II, he won a commission and a Silver Star at sea when the destroyer on which he was gunnery officer downed 23 enemy planes off Okinawa.

Now 40, he still has many vigorous years ahead of him. Green River competitors can expect some tough sales battles in the years ahead. Jim Daniell isn't used to giving ground.

"We switched to TIMKEN® bearings to get greater accuracy and capacity," reports The G. A. Gray Company



How **THE G. A. GRAY COMPANY** mounts the spindle of its new Model 880-FC boring machine on Timken tapered roller bearings to get spindle accuracy, assure precision performance.

HERE'S a precision giant! It's The G. A. Gray Company's new 212½-ton Model 880-FC horizontal boring, drilling and milling machine. Weighing 425,000 lbs., it stands 27 ft. high, spans 76½ ft. in length. It can machine a block of metal 65 ft. long and 15½ ft. high—works with a precision of .00025". Yet one man operates the huge tool. To keep the spindle running accurately, Gray engineers switched to Timken® tapered roller bearings.

Spindle held rigid. Timken bearings hold the spindle in positive alignment. Their tapered design lets them take both radial and thrust loads in all combinations. And full-line contact between rollers and races gives Timken bearings extra load-carrying capacity.

Heavy shocks no problem. Rollers and races of Timken bearings are case-carburized to have hard, wear-resistant surfaces and tough, shock-resistant cores.

Friction virtually eliminated. Timken bearings are geometrically designed and precision-made to roll true. They roll the load. They practically eliminate friction, run smoother, longer with minimum maintenance. For extra quality-control, we even make our own steel. No other American bearing maker does. And you can get Timken tapered roller bearings with maximum runout of 75 millionths of an inch. For all these advantages, specify bearings trademarked "TIMKEN". The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO". Makers of Tapered Roller Bearings, Fine Alloy Steels and Removable Rock Bits.

This symbol on a product means its bearings are the best.

BETTER-ness rolls on **TIMKEN®** tapered roller bearings

Behind Capital Spending Pickup

It wasn't in the cards, but new capital spending programs are very much in the works.

With good business assured, many companies are making long-range plans to overhaul their operations for efficiency and economy.

▪ In the past three months there have been strong hints of renewed capital spending. These hints are now being translated into action.

A major expansion boom is not likely in the sense that it will mean a surge of increased capacity. In most cases, capital spending, like recently announced steel programs, will be planned to round out manufacturing facilities and replace inefficient equipment for more profitable operations.

Improvement Necessary — Increased capacity will result in many cases. But it will be an almost incidental by-product of more efficient equipment and methods. For most industries, present productive capacity is considered adequate in terms of physical output.

This is one of the key reasons why most forecasters underestimated the upturn in spending for new plants and equipment. With so many industries with sufficient or excess capacity, the outlook for revived capital spending was dim.

Surveys Missed — Also, surveys of spending intent did not show any interest in renewed investment. With business poor and equipment standing idle, few executives could foresee any reason to lay out cash or go into debt for equipment.

But when the recovery surprised everybody by turning into a boom, forward looking businessmen began to reevaluate their productive capacity to determine how and where it could be improved for efficiency and profit.

Cautious Planning — However, new capital programs are notable for their caution and planning. Unlike the splurging in 1955 and 1956, new programs are well thought out and are tailored closely to long-range plans for the specific company and the outlook for its industry.

Another factor that will stimulate spending is the amount of diversification in industry and the rapid change in new products. The equipment used in making a TV set today is far different from a few years ago, for example. All these changes mean new tools and new methods.

The outlook for capital spending is still not of a boom nature. But the fact is that most companies in the field are getting renewed business before their backlogs are exhausted. It adds up to another support to the strong overall level of business.

Union Leaders Go Protectionist

▪ "Protectionists" among businessmen are getting some unexpected support where they least expected it —from the labor union.

Union leaders like to appear global in their outlook. Stressing the international aspects of unionism is a manifestation. In this line, they have been among the most outspoken free traders and time and time again have opposed protective measures like tariffs and quotas.

Shoe on Other Foot—But times are changing and union leaders are concerned about jobs in their ranks that are being lost to imports. Up to now, they have not actively pushed for protective measures. But apparently that time is coming, if not already here.

Last week when Walter Reuther, head of the United Automobile Workers, returned from a trip to Europe, he admitted his alarm over inroads of foreign cars into the U. S. auto market—and also into the ranks of UAW employment.

Equalizing Wages—Mr. Reuther hopes to raise the wage standards of European auto workers through an international fair labor standards act. If wages in an importing country do not meet standards, he suggests a "penalty" on cars they sell in the U. S.

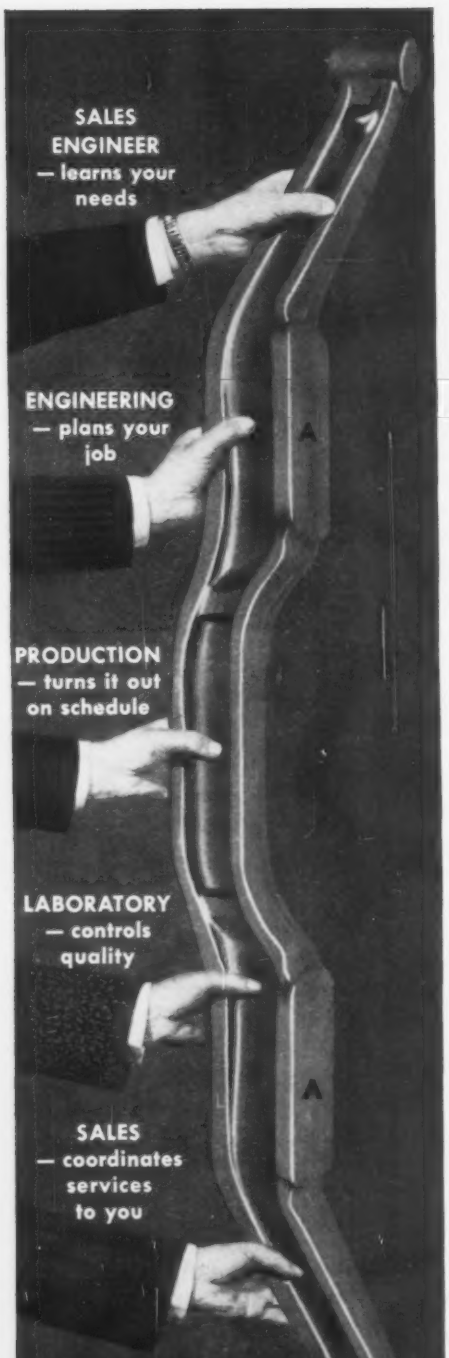
Is there a difference between a tariff and a penalty? The militant UAW head does not say, although he does say his wage equalization program is supported by the International Metalworkers Federation.

Double Standard — Many U. S. industrialists believe that higher wages in European countries are inevitable and provide the long-term solution to U. S. problems in world markets.

But how much cooperation will they get from U. S. unions in equalizing pay rates at home?

Regardless of the irony here, you can expect more and more talk from labor leaders on the "protectionist" theme, although they won't call it that.

But they are acknowledging the export cost problem.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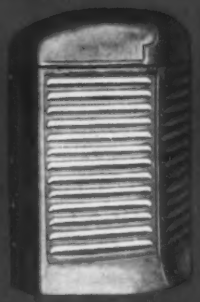
On the 70-inch axle shown at left, *T & W Technique* helped to meet these requirements: The overall length tolerance is held to 1/8-inch; there is no draft on the upper and lower surfaces of the spring pads (A); tops of the spring pads are parallel within 1/16-inch; knuckle pin bosses are in vertical alignment within 1/32-inch.



DEEP DRAWN STAMPINGS like this radiator grill are produced by T & W's Stamping Division. Stampings requiring draws up to 16 inches are produced in sizes up to 60 inches long by 40 inches wide.

• • •

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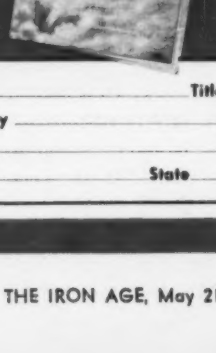

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Plastics Take Aim on Diecasters

Du Pont Has Big Plans for New Acetal Resin

"Delrin" is a new thermoplastic being promoted to the hilt in Detroit by Du Pont.

It's a potential replacement for steel and nonferrous diecastings.—By H. R. Neal.

▪ Conventional diecasting materials such as zinc, aluminum and brass, long accustomed to battling with each other for automotive business, will soon find another competitor scrambling for a sizable chunk of the same business.

Last week Du Pont engineers, taking a page from the aluminum industry's highly successful promotions, descended on Detroit. They hit 300 automotive executives and engineers with both barrels—a new plastic material and a program aimed at saving automakers "some $45 million over the next five years."

Ten Years Research — A new acetal resin, "Delrin," will be in production by mid-1959, according to Dr. John D. Young, of the plastic sales division of Du Pont's polychemicals department. The product of a 10-year research effort, it will be manufactured at Parkersburg, W. Va.

Delrin is a tough, rigid thermoplastic. It was developed, Dr. Young said, "primarily for use in fields now dominated by die-cast metals." The chemical company sees more than 75 pct of its potential applications involving replacement of steel, brass, aluminum and zinc.

The Score to Date — Use of plastics in automobiles is relatively small. Even so, they are now saving automakers an estimated $3 million annually according to Dr. Young.

Acrylic resins, such as Du Pont's "Lucite," are currently being used for 59 applications (such as taillight lenses) and are being used at the rate of about 1.8 lb per car.

Nylon resins average about 0.5 lb per car—but are used in about 50 individual applications in the average car, ranging from brake pedal bushings to gas-filled nylon pouches in shock absorbers (on Cadillacs.) The total number of automotive uses is over 250.

Polyethylene resins are used in more than 30 different applications, average slightly less than 1 lb per car this year. Fluorocarbon resins are just getting a start in the automotive field—present consumption is about 0.01 lb per car.

But in Five Years—The addition of Delrin acetal resin is expected to help boost total consumption of plastics by the auto industry. "Du Pont feels that in 1963 at least 2 lb of Delrin will be used in the average car, making possible remarkable technical advances and cost savings," Dr. Young says.

One possibility is use for instrument cluster housings. A sample

Highway of Tomorrow?

GM VERSION: Operating model of GM's Auto-Control System is explained to George Roberts, 5, by research engineer H. M. Morrison. Electronic controls operate model buses from wires in highway. Signals accelerate and steer bus, or stop it when a vehicle ahead stops in its path.

housing showed an 80 pct weight reduction over the same unit now cast in zinc. While the Delrin is expected to cost 95¢ per lb initially, compared with about 11¢ to 12¢ currently for zinc, substantial savings can be realized in the finished product.

On Instrument Clusters — Electrical circuits can be printed on the back side of the cluster and instrument dial lenses snap-fitted into grooves. The plastic material can either be pre-colored or painted. Additional finishing isn't needed.

Tests showed that, with proper design, "it is literally impossible to strip threads cut into the acetal resin by self-tapping screws. Before stripping occurs, the head of the steel screw will twist off."

Many Other Possibilities—Field tests conducted over the past 3 years with over 250 companies show "unusually wide markets" for the new plastic. Among uses tested, besides instrument clusters, are: Carburetor parts, gears, bearings and bushings, door handles and window cranks, moving parts in clocks, and other consumer products ranging from fishing reels and zippers to aerosol bottles.

Practical possibilities in the automotive field between now and 1964 include a number of applications —many of which would ease a car owner's maintenance problems.

Lubrication Savings—These include non-corroding door locks. (Nothing was said about what effect a heated key would have on a frozen lock in winter, however). Speedometer cable casing which would need lubrication only once during the life of the car.

But Delrin isn't the only plastic to get a "pitch" before the auto industry. Du Pont foresees in the next 5 years:

An increase in the consumption of acrylic resins to a level of 2 lb per car.

A 10-fold increase in the use of fluorocarbon resins.

A 3-fold increase in the use of nylon.

Close to a 40 pct increase in per-car use of polyethylene.

The Bull of the Woods

IF A BANANA SKIN OUT OF THE TRASH CAN SUGGESTS A LADY'S HAT, THEN THEY SURE MUST BE AWFUL THIS YEAR!
I HAVE TO BE AWFUL CAREFUL AT OUR HOUSE, WITH A WIFE AN' TWO DAUGHTERS--WENT OUT TO WASH TH' CAR--THOUGHT I HAD A SPONGE AND A SHAMMY--THEY WERE TWO HATS!
THE FUNNY GUY
© 1959 by NEA Service, Inc. T.M. Reg. U.S.-Pat. Off.

Automotive Production

WEEK ENDING	CARS	TRUCKS
May 16, 1959	135,268	27,175
May 9, 1959	134,763	27,480
May 17, 1958	87,407	16,755
May 10, 1958	78,506	17,438
TO DATE 1959	2,474,452	483,174
TO DATE 1958	1,751,814	342,344

*Preliminary Source: Ward's Reports

No Slip-Stick—To many, one of the most interesting new applications of plastics that is known to be coming in 1960 is the use of a fluorocarbon plastic designed into ball joints for front suspension systems of American Motors automobiles. Because of the material's low coefficient of friction and lack of "slip-stick" (frictional resistance to initial movement), it eliminates the need for ever lubricating the ball joints.

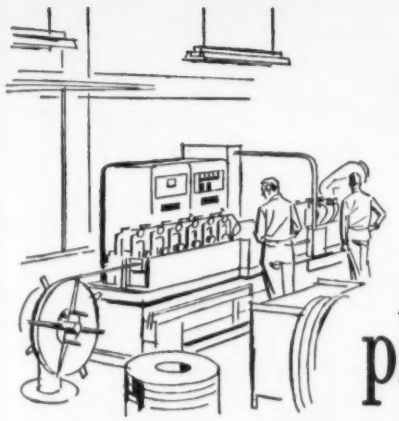
Dr. Young admits we won't see "the so-called plastic car of tomorrow . . . arrive, full-blown, with the 1960 models," But he's confident "plastic engineering materials will not only replace conventional materials, but will often make possible the elimination of components required in a conventional design."

Israeli's Sabra Makes U. S. Debut

Another country, Israel, has entered a bid for a piece of the small-car market in the U. S. The latest entry is the Sabra, a name which refers to a native Israeli, featuring an all-fiberglass body.

Claiming 35 mpg economy, the Sabra will be available in station-wagon delivery van models. It has a wheelbase of 85 in. and chassis length of 136 in. Prices haven't been set, but are expected to be about the same as other foreign-made four-cylinder cars.

It is built in Israel by Auto Cars Co., Ltd., of Haifa and will be distributed by the American Israel Corp. of New York.



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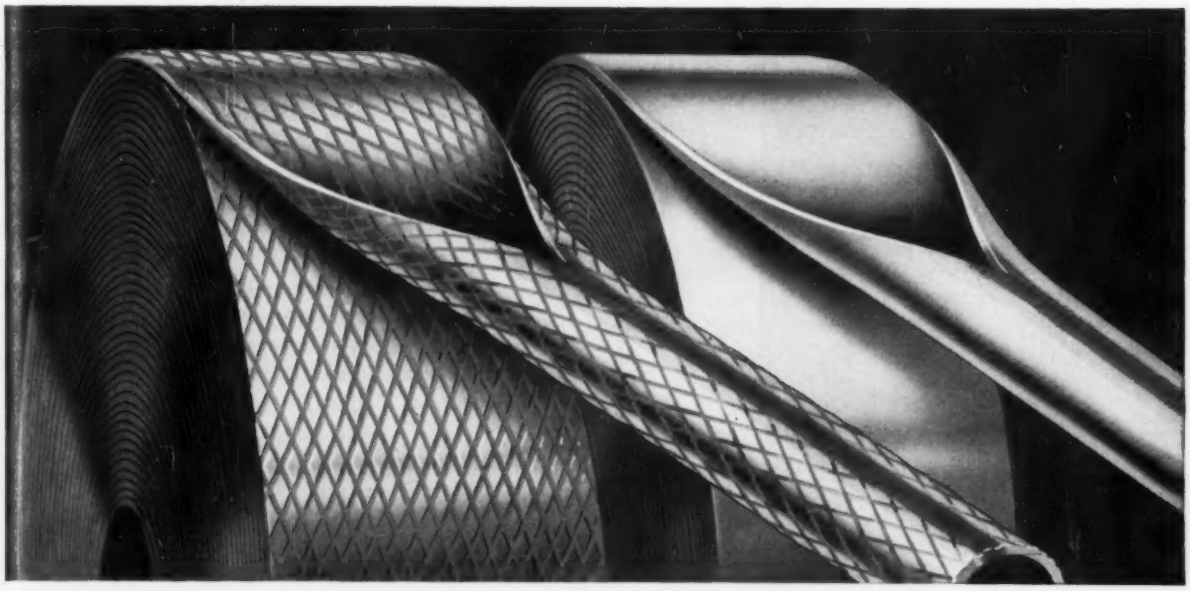

Quaker State Metals Company, leading fabricator of aluminum building products, recently installed a 25 kw, 450,000 cycle TOCCOtron vacuum tube oscillator for continuous welding of aluminum tubing. Both plain and patterned strip, anodized or untreated according to end-use requirements, is continuously welded. Diameters vary from ½" to 1" O. D. and wall thicknesses from .024 to .064".

The weld is absolutely uniform throughout the entire length, assuring a dependable, strong bond. The whole operation is so smooth and quiet, you hardly know it's running.

Aside from the perfect weld, for the ultimate in product quality, TOCCO Induction Welding, being a completely automatic process, saves time and money over many conventional joining methods.

Remember, whether *your* products are of ferrous or non-ferrous metals, TOCCO can almost certainly save *you* time and money in heat-treating, brazing, welding, or hot forming operations.

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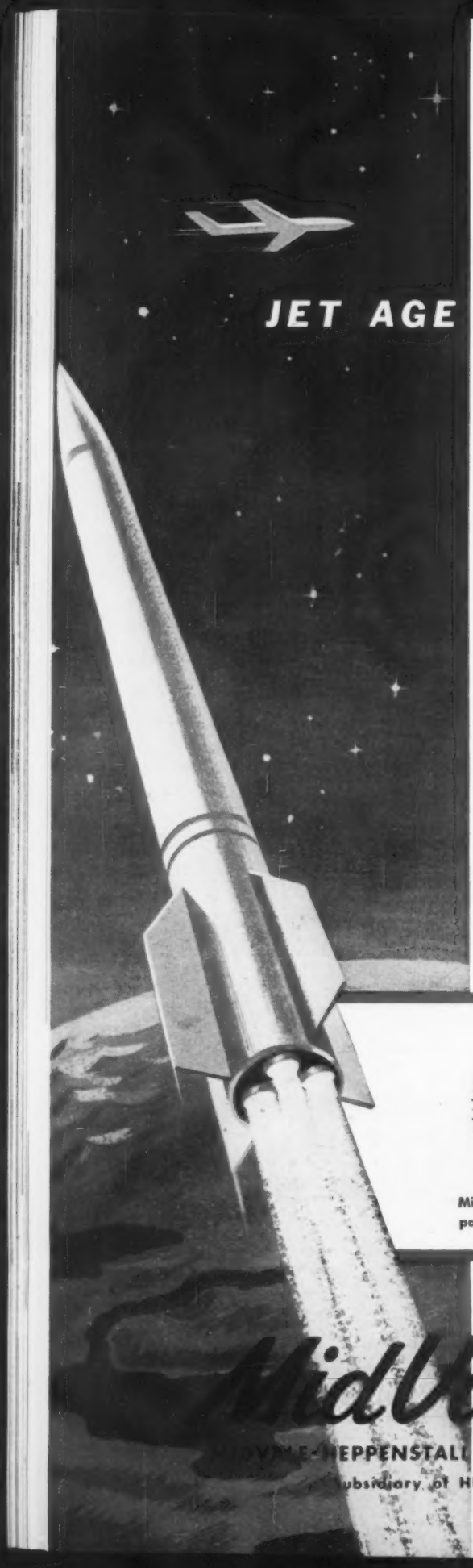

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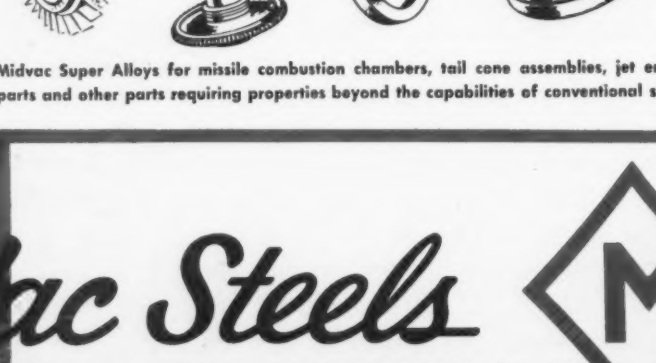

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Military Needs Buying Lesson

Duplication Costs Heavily in Time and Money

Centralized procurement for Army, Navy, and Air Force is the answer.

The question is will the President and Congress force the Armed Services to mend their ways.—By G. H. Baker.

▪ Some wasteful government buying practices are under attack. Reform is long overdue. But whether the White House and Congress will show the courage to demand reform is something else again.

Here's what's happening: A decade ago, Congress took the first steps toward centralized government buying. Army, Navy, and Air Force were told to get together and agree on common purchasing of items used by all three.

Government Shopper — At the same time, the General Services Administration was designated the sole government buying agency for all nonmilitary items.

It hasn't worked out. Despite some finger-wagging warnings from Congress, the Army, Navy, and Air Force still go their separate purchasing ways. Real reason: No supply officer is willing to surrender any part of his staff authority to rival officers.

Against Togetherness—The reasons given publicly, however, run to such strange logic as, for example, "Our requirements for pencils are different. We couldn't possibly accept their specifications for pencils." Yet pencil manufacturers will tell you the specifications are remarkably similar.

Also, the Pentagon has stubbornly refused to surrender procurement of nonmilitary supplies to the civilian General Services Administration.

Crusader — Representative Clarence J. Brown (R., O.) is a self-educated expert on government procurement and the need for improvement. His constant nudging of military buying officials has brought some badly-needed reforms. But much remains to be done—both at the Pentagon and at the White House.

In his drive for a cleanup of government buying methods, Congressman Brown is calling upon the policy-making Budget Bureau to knock a few military heads together and start weeding out waste in military buying of such common articles as office supplies and office furniture and equipment.

Not Zealous Enough — Mr. Brown chides the Budget Bureau for being less than zealous in its search for more efficient procurement methods. "If this is not a management and organizational problem of the highest order, then there is none," he concludes tartly.

What Mr. Brown is proposing will not necessarily result in any reduction in the volume of government procurement. But what we have here is an opportunity for meaningful and rewarding reform of today's duplicating (even triplicating) and costly government procurement methods.

Who Will Get Defense Post?

Wants to Go Home — Possibly next fall, Neil H. McElroy figures he will get the opportunity to retire as Defense Secretary.

Mr. McElroy has held the top Pentagon post since late 1957, has said he would like to return to private industry this year. He was earning about $280,000 a year as head of Procter & Gamble.

Make New Plans—His plans to resign have been imperiled by the tense situation in Germany, and by the recent death of the Deputy Secretary, Donald A. Quarles. Mr. Quarles was considered the likely choice as the next Defense Secretary.

One important consideration in choosing the next Defense Secretary is the relatively short time available for his training. To reduce the break-in time, President Eisenhower may select someone from within the defense establishment.

W. J. McNeil, the veteran and gifted Defense Comptroller, probably will be considered for a step-up in duties. His grasp of budget facts has earned him substantial respect both in the Pentagon and on Capitol Hill. If he is nominated, Congress is likely to present little opposition.

Outside the department, Interior Secretary Fred A. Seaton and Red Cross president Alfred M. Gruenther are often mentioned. Mr. Seaton, an Eisenhower Administration stalwart, could be expected to reflect the President's military views. Gen. Guenther is a long-time associate of the President and served with distinction as top military commander in Western Europe.

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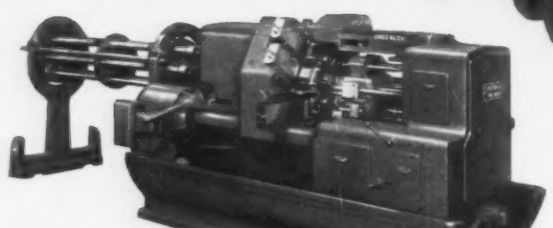

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Automatic Bar Machine

Mounts on Main Tool Slide

The Greenlee milling attachment eliminates second operation milling on many jobs. Two millers, normally mounted in 3rd and 4th positions, can profitably mill squares or double slot end of work piece at bar automatic speeds. The cutter head rotates at the same RPM as the work piece. Cutter speed is independent of spindle speeds. The Greenlee milling attachment is only one of many versatile standard and special attachments that expand your job range . . . increase your profits. Find out how Greenlee attachments can help you. Get the details from your Greenlee Distributor.

Write for your copy of Catalog A-405 — first step on the way to more profitable production with Greenlee Automatic Bar Machines.

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New Ideas in Racing Car Design

Entries in Memorial Day '500' Have New Features

As traditional as the Indianapolis 500-mile race are the design twists introduced each year.

In next week's race one entry will use an air-jack system to speed pit stops.

Another has engine turning counter-clockwise for better handling.—By R. R. Kay.

■ "Gentlemen, start your engines" will soon be heard again at the Indianapolis Speedway.

In the drive for gold and glory, the 500-mile speed classic is sure to be packed with thrills. Prize money: $300,000.

The Memorial Day grind will send 33 of the world's fastest cars chasing each other around the oval.

New Track Record—With good track conditions, speed for the race should average a sizzling 137 mph —a new high. Don't be surprised to see a new one lap record of 149 mph.

Precious seconds in the pits may win or lose a race. In a try to make it three in a row, the two-time winner, Belond Muffler Special, has a new feature.

Saves Pit Time—Builder George Salih, Los Angeles, is trying a self-contained air-jack system to raise the entire car off the ground in one-half second. Salih believes he can save up to seven seconds on each pit stop.

Incidentally, such an air-jacking system would bring joy to the heart of any motorist. Just flip a petcock and all four wheels are up.

Some racing enthusiasts call the 500-miler a Meyer and Drake derby. And they're quite right. The 4-cylinder M & D 255 cu-in. Offenhauser will power at least 30 of the 33 starters.

THREE WINS IN A ROW?: That's what Designer-Builder George Salih, (l), Driver Jimmy Bryan and Co-mechanic Howard Gilbert hope the Belond AP Muffler Special can do in the 500-mile Memorial Day race.

Follow the Leader—Two years ago the Belond Muffler Special laid its engine on its right side, 18 deg from horizontal. It won the race. And won again in 1958.

This year at least eleven cars are so designed.

Turnabout—And on the Racing Associates Special, builder Luigi Lesovsky, Los Angeles, is turning his engine counter-clockwise, reversing the conventional right hand rotation. He hopes that the reversed driving torque reaction will give better chassis handling in the race's 800 left turns.

Here's how he's doing it: (1) placing the chassis 2 in. off center to the left, (2) slanting the engine to the left, and (3) putting the driver on the left.

Car builder Frank Kurtis, Glendale, Calif., is using titanium in the Bowes Seal Fast Special. It's the first time, he says, that the metal appears on an Indianapolis car.

Vibration test of ingot bundle. Signode vibrator handles up to 3 tons at accelerations over one G.

After test, equivalent to the effect of expected actual handling and transit, the bundle still looked like this.

Shake well before shipping!

A neat 2,300 pound bundle of aluminum ingots becomes 44 ingots trying desperately to go their separate ways...driven by the joggles and jolts of the vibration tester in the Signode Packaging Laboratory. The ingots hold together, though. They're bound to...by 51 cents worth of steel strapping pulled to about 3,000 pounds tension. We don't know of another material that could do this job at all...let alone at such low cost. And consider the savings of having Signode find out *in advance* and at no cost to you how to make your product behave in transit. This is one more way Signode helps make things cost less to handle, store, ship, and receive. For further information, talk to the Signode man near you, or write:

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It's Productivity That Counts

Don't Forget That in Planning for New Equipment

Carl Beach tells tool engineers not to get too tangled up in the details.

It's not always the same type of machine that should be bought to replace an old unit.—By E. J. Egan, Jr.

▪ When it comes to equipment-replacement analysis, don't get so wrapped up in details that you miss the point of the thing.

It can be summed up in one word: productivity.

All too often the replacement debate merely pits the operating cost advantages of a machine tool against a proposed new machine of the same general type. It's easy to overlook an altogether different type of equipment that may really do a better job.

Tells How—Carl Beach, executive vice president of The Heald Machine Co., bore down heavily on this blind spot at the annual meeting of the American Society of Tool Engineers in Milwaukee.

He admitted the value of using records on maintenance costs, downtime, production performance, and tooling costs in any replacement study. "But the most important analysis should be of the kind of equipment that is available to do a better, more economical job than current methods," he emphasized.

. . . To Machine Blocks—To illustrate, Mr. Beach traced various method changes in the machining of automobile engine blocks. "In the early days of mass-produced cars," he said, "it took 75 men operating 75 milling machines to machine 125 engine blocks per hour. Each machine milled one surface at 6 to 8 ipm. Floor space of 13,500 sq ft was required.

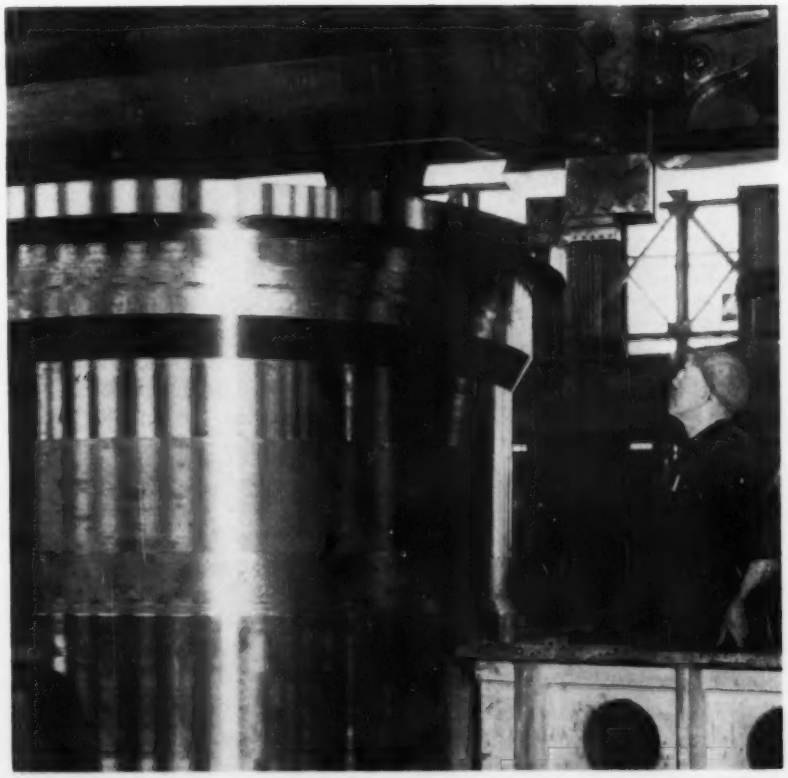
"Progress brought a machine that could mill the top, bottom and bearing lock surfaces simultaneously, and carbide cutters with feed rates of 20 ipm. The same 125 blocks required only 6 machines and 6 operators working in 1380 sq ft of space.

Getting Faster—"The next step was the use of a horizontal broach with high speed steel blades working at 45 fpm. Machining the 125 blocks then required only two machines, two operators and 750 sq ft of floor space.

"Today, one horizontal broaching machine does all the operations, using tungsten carbide inserts at feed rates of 100 fpm. The entire operation occupies 375 sq ft of floor space."

Cause of Change — Mr. Beach explained that each method change came about because equipment policy was based on productivity rather than the value of machines in use.

Throw-Away Inserts Cut Longer



KEEP GOING: Four-edged Kennametal carbide inserts give Baldwin-Lima-Hamilton up to 12 hours of continuous cutting on stainless casting.

INDUSTRIAL BRIEFS

Another for McLouth—Pennsylvania Engineering Corp., New Castle, Pa., has another order for a basic oxygen furnace for the Trenton, Mich. plant of McLouth Steel Corp. The furnace will have a nominal capacity of 110-tons per heat and is scheduled for operation late this year.

Name Change — The Hamilton Foundry & Machine Co., Hamilton, O., became Hamilton Foundry Inc. on May 1. Along with the name change, work is beginning on a $150,000 office addition and modernization program.

Rheem to Aerojet—Rheem Mfg. Co. and Aerojet-General Corp. have reached an agreement whereby Rheem will sell facilities at Downey and Riverside, Calif., to Aerojet. The transaction, effective May 31, will involve the transfer of employees, production and facilities, including about 600,000 sq ft of plant space.

HORATIO ALGER: Albert J. Berdis, president, Weirton Steel Co., left, receives Horatio Alger Award from Dr. Norman Vincent Peale. Award was made to nine business and professional leaders who started out as poor boys.

Basic Expansion—Kaiser Aluminum & Chemical Corp. will expand its refractory magnesia operations by constructing a new plant at Midland, Mich. Principal product will be high-purity periclase, a dense, crystalline magnesia for use in basic refractories. Estimated cost will be about $3 million. Construction will start within the next two months.

Man of the Year — Walter J. Kinderman, director, engineering research, Yarnall - Waring Co., Philadelphia steam plant equipment manufacturer, has been named "Metals Man of the Year" by the Philadelphia Chapter of the American Society for Metals.

Pipe and Tubing—Phoenix Steel Tube Div. of Phoenix Steel Corp. is now manufacturing seamless low-chrome analyses pipe and tubing in diameters from 8.625 in. to 16 in. and wall thicknesses from ⅜ in. to 3 in.

Armco Gets Nod—Armco Steel Corp.'s new aircraft and missile steel—PH 15-7 Mo—has been selected as the main sheet construction material for the B-70 Valkyrie and the F-108, two ultra high speed jet aircraft being built by North American Aviation, Inc.

Money for Expansion—National Steel Corp. has filed a registration statement with the Securities and Exchange Commission covering a proposed issue of $80 million first mortgage bonds, due 1989. The offering will be underwritten by a group headed by Kuhn, Loeb & Co., Harriman Ripley & Co., Inc. and The First Boston Corp. Proceeds will be used in connection with National's $300 million expansion program.

Clevite Branches Out — Clevite Corp. will build a $3 million transistor and diode manufacturing plant in Waltham, Mass. The new Clevite Transistor Products plant is scheduled for operation early next year. The site will permit additional expansion.

New Association—A new trade group, the Automatic Welding Machinery Assn., has been formed with headquarters in The 1010 Euclid Bldg., Cleveland. The Association will promote greater and wider uses and markets for automatic welding machinery. E. W. Hollis, Lewis Welding & Engr. Corp., Bedford, O., is first president.

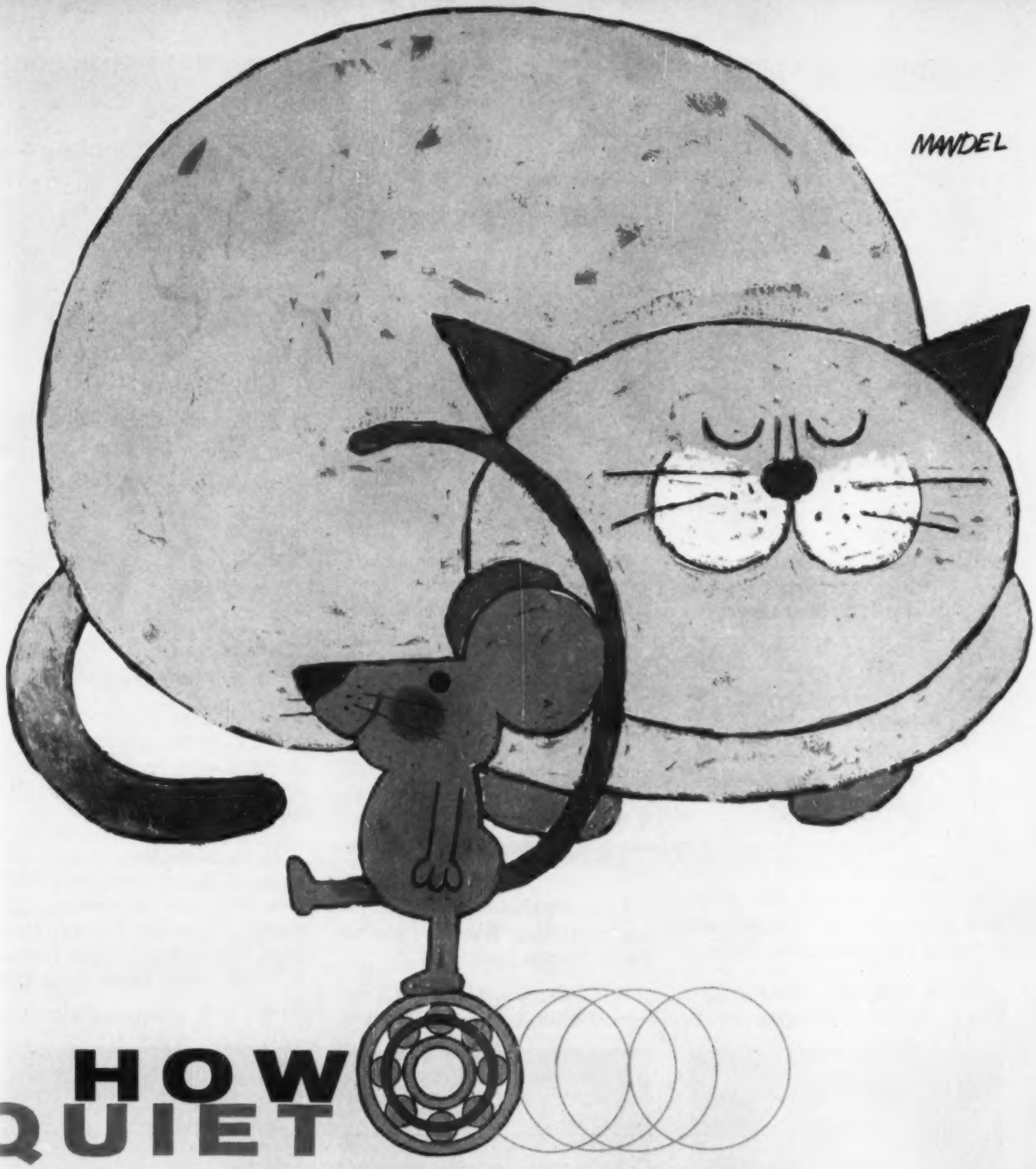
Shelters for Welders — Portable shelters have been designed by Luria Engineering Co. in conjunction with engineers of the New York Shipbuilding Co. The shelters are used to protect welders on the ground, on the deck of ships or on permanent welding platforms.

Moving Day—International Lubricant Corp., has moved its executive offices and laboratory facilities into a new $850,000 building located northwest of the city limits of New Orleans on the Airline Highway. ILC makes lubricating greases and oils for automotive, marine, aviation, and industrial uses.

AC in Reactors—Allis-Chalmers Mfg. Co., has purchased the commercial nuclear reactor engineering office, Washington, D. C. of Nuclear Products—Erco Div. of ACF Industries. AC will take over ACF's commercial reactor organization with its contractual obligations for the design and construction of power, test, and research reactors.

One After the Other—The second $1 million expansion project at the Tyson Bearing Co. plant, Massillon, O., will be viewed by the board of directors. Tyson, a division of SKF Industries, Inc., completed the first phase of a $1.2 million project and is beginning a second project to provide an additional 33,000 sq ft of production area.

On the Coast—The United Manufacturing Co. has opened a new West Coast plant to be called The United Caravan Axle Co., Div. The plant is located at 1326 N. Tyler Ave., El Monte, Calif., and will manufacture axles and axle assemblies for the West Coast.



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can a ball bearing be?

Federal Ball Bearings are to be seen, but not heard! Elusive noises are intercepted by inspection engineers at "quiet control" points all along our production line. They want to hear the soft, sweet purr that signifies a perfect bearing, because that's the only kind we'll tolerate. That's why every bearing goes through scores of quality control tests before we send it out. Customers who get these perfect bearings number among the most respected names in American industry. We'd like to include you. Start with our catalog—over 12,000 ball bearing sizes, hundreds of types. Send for it today.

THE FEDERAL BEARINGS CO., INC., Poughkeepsie, N. Y.

Federal

BALL BEARINGS

One of America's largest ball bearing manufacturers

FEDERAL ON FILM—A 16 mm. color sound film takes you through our 400,000 sq. ft. plant. Loaned free. Just ask for it.

Oscar Pearson, named administrative vice president, steel producing divisions, **U. S. Steel Corp.**

E. H. Gott, becomes administrative vice president, Central Operations (Steel & Coal), **U. S. Steel.**

Al Thurman, named president, **The Lombard Mfg. Co.,** and vice president, **Lombard Corp.,** with headquarters in Youngstown, O.

L. C. Felder, elected president, **Virginia Metal Products, Inc.,** Orange, Va.

M. F. Dufour, elected executive vice president and director, **Freeport Nickel Co.,** New York, subsidiary of **Freeport Sulphur Co.**

L. H. Schuette, administrative vice president, all operations, **Sundstrand Corp.,** Rockford, Ill.; **A. H. Swenson,** named vice president, **Hydraulic Div.**

H. L. Spaunburg, Jr., appointed vice president, manufacturing, **The Hartford Special Machinery Co.; R. A. Bode,** named vice president, sales, and **F. A. Carr,** factory manager.

C. C. Hornbostel, named corporate controller, **Hooker Chemical Corp.,** Niagara Falls, N. Y.

K. C. Gardner, Jr., elected treasurer, **United Engineering & Foundry Co.; C. W. Rebhun,** elected controller; **N. J. Chavern,** elected assistant secretary.

C. C. Benedict, appointed assistant treasurer, **Chrysler Corp.,** Detroit.

J. P. Wood, named power equipment consultant, **I-T-E Circuit Breaker Co.,** Philadelphia.

R. D. Loeffler, appointed manager, dome sales, **Kaiser Aluminum & Chemical Sales, Inc.**

E. L. Kemper, appointed manager, **Salt Bath Furnace Div., Lindberg Engineering Co.,** Chicago.

B. L. Owens, named manager, industrial sales, **Atkins Saw Div., Borg-Warner Corp.; J. R. Moore,** appointed **Central Div.** manager.

E. J. Mammana, appointed to New York district office, **Riverside-Alloy Metal Div., H. K. Porter Co., Inc.**

W. P. Keefe, appointed assistant manager, sales, St. Paul district sales office, **American Steel & Wire Div., U. S. Steel Corp.**

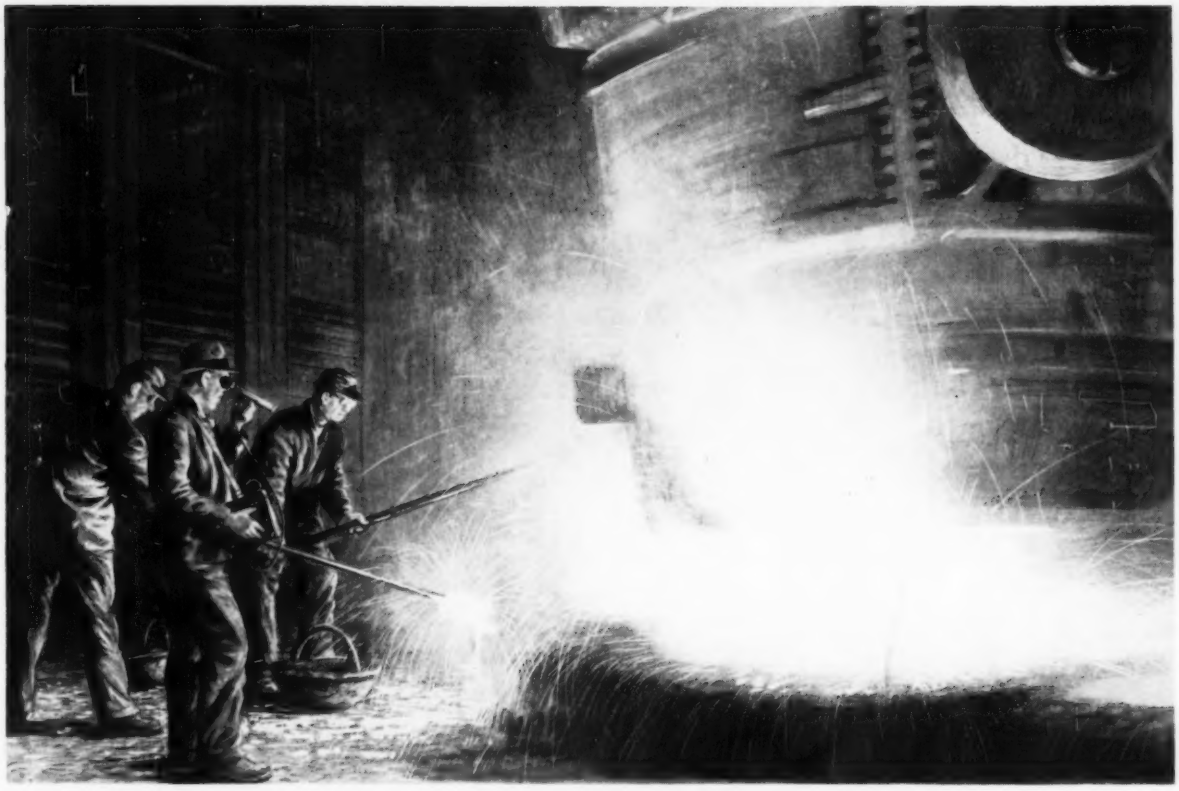
R. B. Humphrey, named sales manager, **Power Tool Div., Rockwell Mfg. Co. of Canada, Ltd.,** Guelph, Ontario; **Harold Jones,** promoted to East-Central regional manager, **Delta Power Tool Div.,**

(Continued on P. 131)

R. Milham, appointed manager, international sales, **International Div., The Foxboro Co.,** Foxboro, Mass.

G. H. Gleason, named assistant manager, international operations, **International Div., The Foxboro Co.,** Foxboro, Mass.

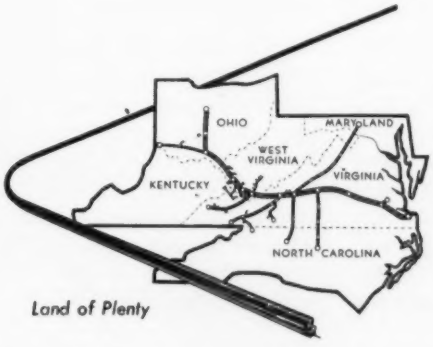
Ed Laxo, appointed special machinery designer, **Container Div.,** Hastings, Mich., **The E. W. Bliss Co.**



ANOTHER 47,100,000 TONS PER YEAR OF STEEL CAPACITY NEEDED BY 1975

According to authentic sources, the steel industry will need to add another 47.1 million tons capacity by 1975. In building plants to meet this added demand, steelmakers are invited to consider the advantages offered by the Land of Plenty. Within these six progressive states served by the Norfolk and Western are vast deposits of the finest metallurgical Bituminous Coal, and multi-million ton deposits of low-grade iron ore and top-quality limestone. Manganese, for the large family of tough manganese steels, is available in substantial quantities. Water, vital to steelmaking, is exceptionally abundant, with rainfall in the Land of Plenty 30% above the national average. One-sixth of the nation's electric utilities generating capacity assures ample power for steelmaking.

Moreover, you can count on such other advantages as dependable manpower, communities friendly to industry, reasonable taxes, N&W Precision Transportation with connections to domestic markets—North—South—East—West — and access to world markets through the modern Port of Norfolk on famed Hampton Roads. Get the full story on the Land of Plenty now. Without obligation and in strict confidence, write, wire or call:



Land of Plenty

L. E. Ward, Jr., Manager
Industrial and Agricultural Dept.
Division IA-835 (Phone DIamond 4-1451, Ext. 474)
Norfolk and Western Railway
Roanoke, Virginia

Norfolk and Western RAILWAY

For quick, competent assistance on shipping problems — talk with the N&W freight traffic Sales and Service representative nearest you . . . in one of 39 key cities across the U. S.

Photograph by Bruce Davidson

LARRY DUNN PUTS METAL ON SKYLINES

Before most architects even dreamed of buildings decked in bright blue or green or gold, Larry Dunn had them towering on the skyline in his mind's eye. But by 1948, he could point to half a dozen . . . by 1954, more than 100. Today, the number exceeds 600 and keeps growing.

It is not enough that aluminum-clad skyscrapers go up faster at lower cost, or even that they defy corrosion to keep maintenance negligible. What counts most is that, as a member of the Alcoa Development Division team, Larry Dunn helped put the color, form and texture of aluminum into the hands of architects. With this new-found freedom from the tyranny of brick and stone came stirring revolutions in the architectural designs for buildings of all kinds, both commercial and industrial.

Because Alcoa has people like Larry Dunn to put unequaled resources for sales development at your command, you get extra value in every pound of Alcoa® Aluminum you buy. The added value of their services starts when you call your local Alcoa sales office. Aluminum Company of America, 2018-E Alcoa Building, Pittsburgh 19, Pa.

ALCOA ***helps you design it, make it, sell it***

Alcoa has hundreds of Larry Dunns to help you design it, make it, sell it

All of Alcoa's skills are mobilized to a single purpose: To put more than just 16 ounces of metal in every pound of Alcoa Aluminum you buy. Here are 12 of the dozens of ways to do it:

1. **Research Leadership,** bringing you the very latest in aluminum alloys and applications.
2. **Product Development** by specialists in your industry and your markets.
3. **Process Development Labs** for aid in finishing, joining and fabricating.
4. **Service Inspectors** to help solve production problems at your plant.
5. **Quality Control** to meet top standards or match your special needs.
6. **Complete Line** including all commercial forms, alloys, gages, tempers.
7. **Availability** via the nation's best stocked aluminum distributors.
8. **Foremost Library** of films and books to help you do more with aluminum.
9. **Trained Salesmen** with a wealth of on-the-spot information.
10. **Sales Administrators** constantly on call to service your orders.
11. **Year-Round Promotions** expanding your old markets, building new ones.
12. **The Alcoa Label,** leading symbol of quality aluminum, to mark your goods.

Added Values With Alcoa Aluminum

. . . is a case book of Alcoa special services and a guide to their availability in design, manufacture and sales. Your copy, with some of the most rewarding information you may ever read, is waiting and it's FREE. Write: Aluminum Company of America, 2018-E Alcoa Building, Pittsburgh 19, Pa.

(Continued from P. 128)

Rockwell Mfg. Co., Pittsburgh.

W. W. Skaggs, appointed branch manager, Portland, Ore., **Atkins Saw Div., Borg-Warner Corp.**

J. W. Hosler, appointed marketing manager, Kewanee and Nesbitt product lines, **Industrial Div., American-Standard.**

R. M. Gilason, appointed product manager, aluminum products, **U. S. Steel Supply Div., U. S. Steel Corp.**

Leo DeFiore, appointed director, engineering, and **C. J. Lucas,** chief engineer, **The Youngstown Sheet & Tube Co.,** Youngstown, O.

R. E. Herzler, Jr., named product manager, aluminum, **Chase Brass & Copper Co.,** a subsidiary of **Kennecott Copper Corp.**

H. R. Cameron, appointed vice president, **Pittsburgh Bridge & Iron Works,** Pittsburgh.

Crucible Steel Co. of America has made the following appointments in its Maintenance and Construction Div. at Midland, Pa.: **C. A. Jacoby,** named superintendent, and **W. E. Rice, Jr.,** assistant superintendent, Construction Dept.; **J. N. Hancock,** becomes superintendent, Maintenance Dept.; **W. D. Drummond,** assistant superintendent; **D. F. Burns,** named superintendent, shops; **Nicholas Kleon,** becomes assistant superintendent.

L. R. Farber, appointed marketing manager, **Temco, Inc.,** Nashville, Tenn.

D. R. Roche, appointed assistant to the manager, cold finished bar products, **Jones & Laughlin Steel Corp.**

A. M. Killin, appointed assistant to works manager, **Union Carbide Metals Co.,** Div. of **Union Carbide Corp.; B. C. Casto,** named warehouse supervisor, Pittsburgh region.

H. W. Speidel, appointed manager, sales product planning, **SKF Industries, Inc.,** Philadelphia.

R. M. Furlaud, appointed corporate vice president, **Olin Mathieson Chemical Corp.**

Richard Bryce, named treasurer, **Olin Mathieson Chemical Corp.**

J. E. Williams, appointed corporate vice president, manufacturing services, **Olin Mathieson Chemical Corp.,** and a member of the president's staff.

(Continued on P. 134)

production problem

Mass-production of modern "wonder alloys" might, in some respects, be compared with an attempt at assembly-line fabrication of Cellini's famed sculpture of "Perseus".

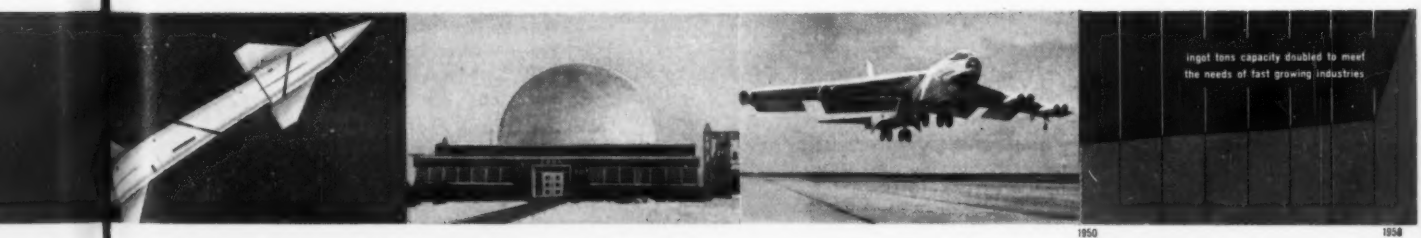
Both would require the careful precision, the intricate craftsmanship of experienced specialists, intimately familiar with ultra-modern production techniques.

Yet within the past year, high volume production of quality specialty steels has become a reality at *Carpenter. Ingot tonnage capacity*—the equipment and quality controls required to produce the world's finest steels—has *doubled almost overnight* through the acquisition of steelmaking facilities in Bridgeport, Connecticut.

For many years, demands by American industry for *Carpenter*-quality stainless, tool and alloy steels often exceeded our ability to produce. Like that of all custom-craftsmen, our objective was *quality*, the pioneering of new and better steels, rather than *quantity*.

Today, as the result of long-planned expansion, we can offer *quantity* along with famous *Carpenter quality*. For the first time, with our increased capacity, both quantity and quality are available. And both will continue to be available, even in times of peak demand.

While *quality* will continue to remain a sacred *Carpenter* watchword, we are determined to lead the way and grow apace of the ever-increasing demands of industry for the world's finest specialty steels.



tool and die steels
stainless steels
electronic and magnetic alloys
special-purpose alloy steels
valve, heat-resisting and super alloy steels
tubing and pipe
fine wire specialties

Carpenter steel

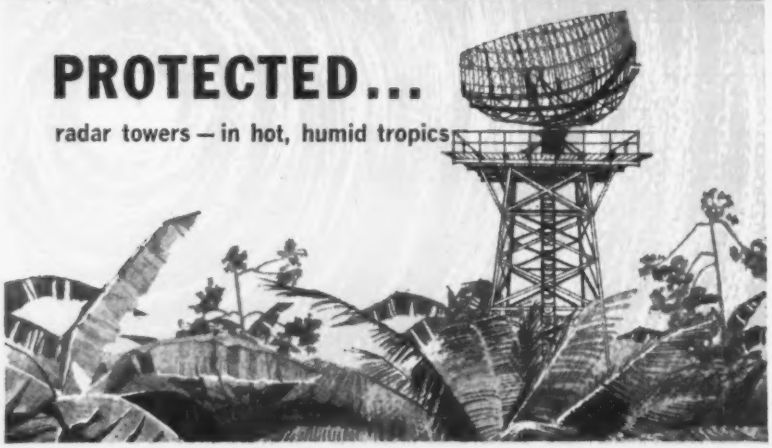
The Carpenter Steel Company
Main Office and Mills, Reading, Pa.
Alloy Tube Division, Union, N. J.
Webb Wire Division, New Brunswick, N. J.
Carpenter Steel of New England, Inc., Bridgeport, Conn.

WEBSTER

gal-va-nize (găl'və nīz'), *v.t.* 1. to simulate by or as by a galvanic current. 2. to coat (metal, esp. iron or steel) with zinc.

PROTECTED...

radar towers — in hot, humid tropics



radomes — in frozen arctic wastes

...ZINCILATED

USAF Photos. Zincilate (Spec. MIL-P-26915) is approved as alternate to hot-dip (ASTM-A123) galvanize under Spec. MIL-T-26433, Towers, Temperate and Arctic.

Zincilate *can* provide true galvanic protection for these vital components in our radar defense network, because Zincilating is the new method of galvanizing — as modern as a missile.

Zincilating can be done anywhere, any time, on any product or structure of any size or shape. As on these radar towers, where Zincilate was brushed on to repair faults and weaknesses of an old galvanizing method. No pre-treatment of the original galvanize was required.

Zincilating saves time, money, materials and manpower. As on radome maintenance, where *three* coats of ordinary material should be applied to every structure during the 60 days suitable for maintenance work, but where *one* coat of Zincilate actually affords more complete, longer-lasting protection because it dries faster and harder under arctic conditions.

Zincilate, applied by spray, brush, roller-coat or pressure curtain, has much to offer any company working in iron, steel or aluminum, for military or commercial use. Write, without obligation, for complete information including military specification approvals and certified test reports.

PROTECTION that SELLS your PRODUCTS

INDUSTRIAL METAL PROTECTIVES

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(Continued from P. 131)

J. C. Jewett, named vice president, sales, **Pittsburgh Div., Screw & Bolt Corp. of America.**

C. M. Smith, appointed chief engineer, **Stainless and Strip Div., Jones & Laughlin Steel Corp.**

P. C. Fourney, appointed assistant works manager, **Union Carbide Metals Co.,** Div. of **Union Carbide Corp.**

J. T. Howland, named a field engineer, **Denison Engineering Div., American Brake Shoe Co.,** Columbus, O.

OBITUARIES

M. C. Taylor, 85, former chairman of the board, **U. S. Steel Corp.**

B. F. Bower, founder and president, **Pines Engineering Co., Inc.,** Aurora, Ill.

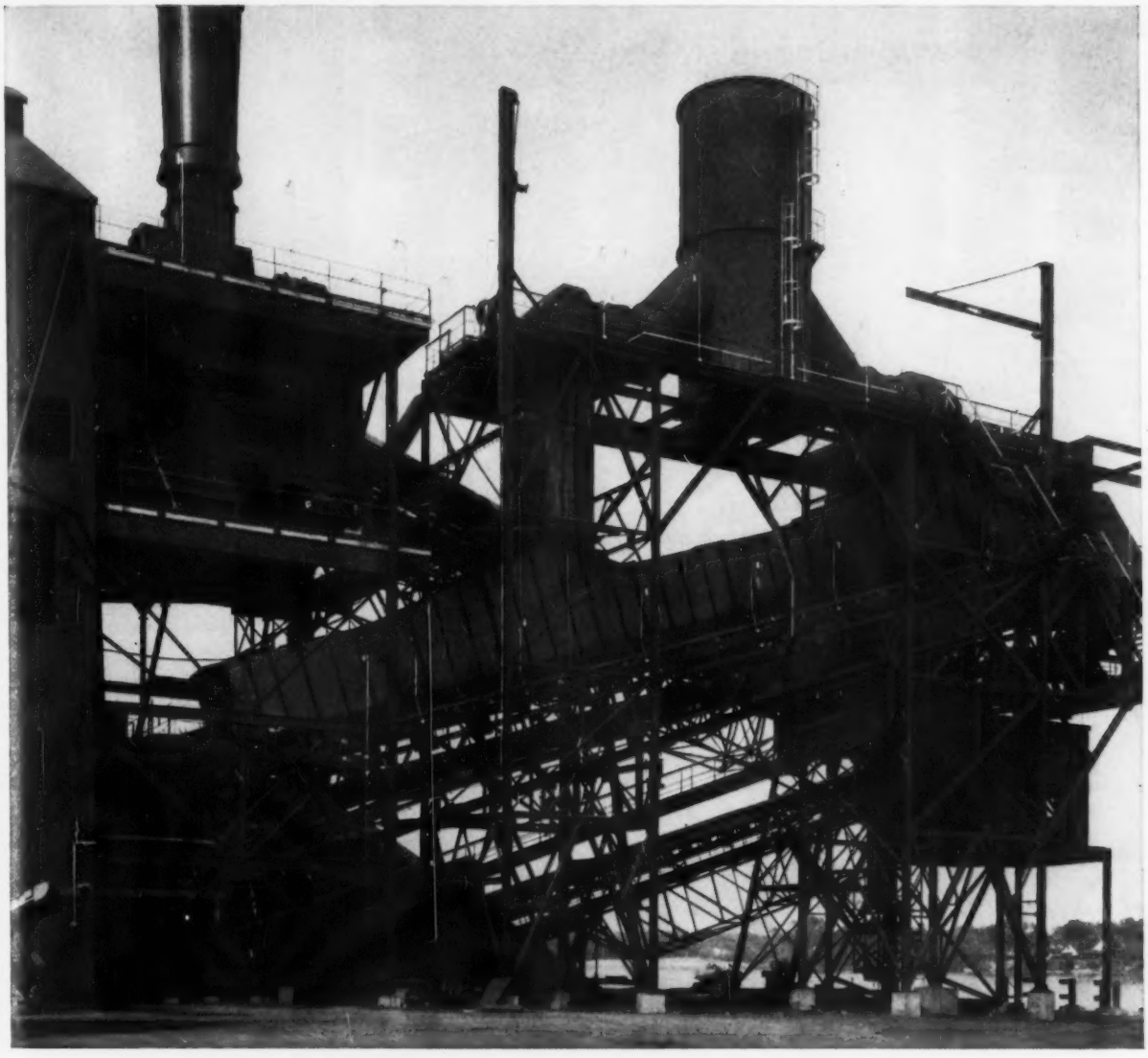
P. A. Montanus, 76, president, **The Springfield Machine Tool Co.,** Springfield, O.

L. G. Tinkler, 65, retired metallurgical engineer, **Vanadium Corp. of America.**

J. B. Hendrickson, founder and chairman of the board, **Welding Engineers, Inc.**

R. J. Skinner, 52, sales manager, **Rockford Machine Tool Co.,** Rockford, Ill.

R. W. Thompson, 60, sales engineer, **Transue & Williams Steel Forging Corp.**



sinter air-cooled and elevated at same time . . .

DRAVO-LURGI STRAIGHT LINE COOLER

Utilizing the air-cooling principle which delivers more *usable* tonnage, the Dravo-Lurgi straight line cooler raises sinter at the discharge end for storage in bins or for conveying. Output is increased by reduction of shattering and dust.

Where space permits its installation, the straight line design provides an extremely efficient method for both cooling and handling sinter. Here are some of the features which lead to maximum utilization of any sinter machine:

- No water quenching to cause shattering, cracking or brittleness.
- No need for plows or scrapers at the discharge end.
- Sinter is undisturbed during cooling—breakup is minimized.
- Sinter is elevated while cooling, facilitating loading.

A Dravo engineer will be glad to explain how Dravo-Lurgi coolers (either straight line or circular) can increase *usable* tonnage in your sintering operation. Write or phone DRAVO CORPORATION, PITTSBURGH 22, PENNSYLVANIA.

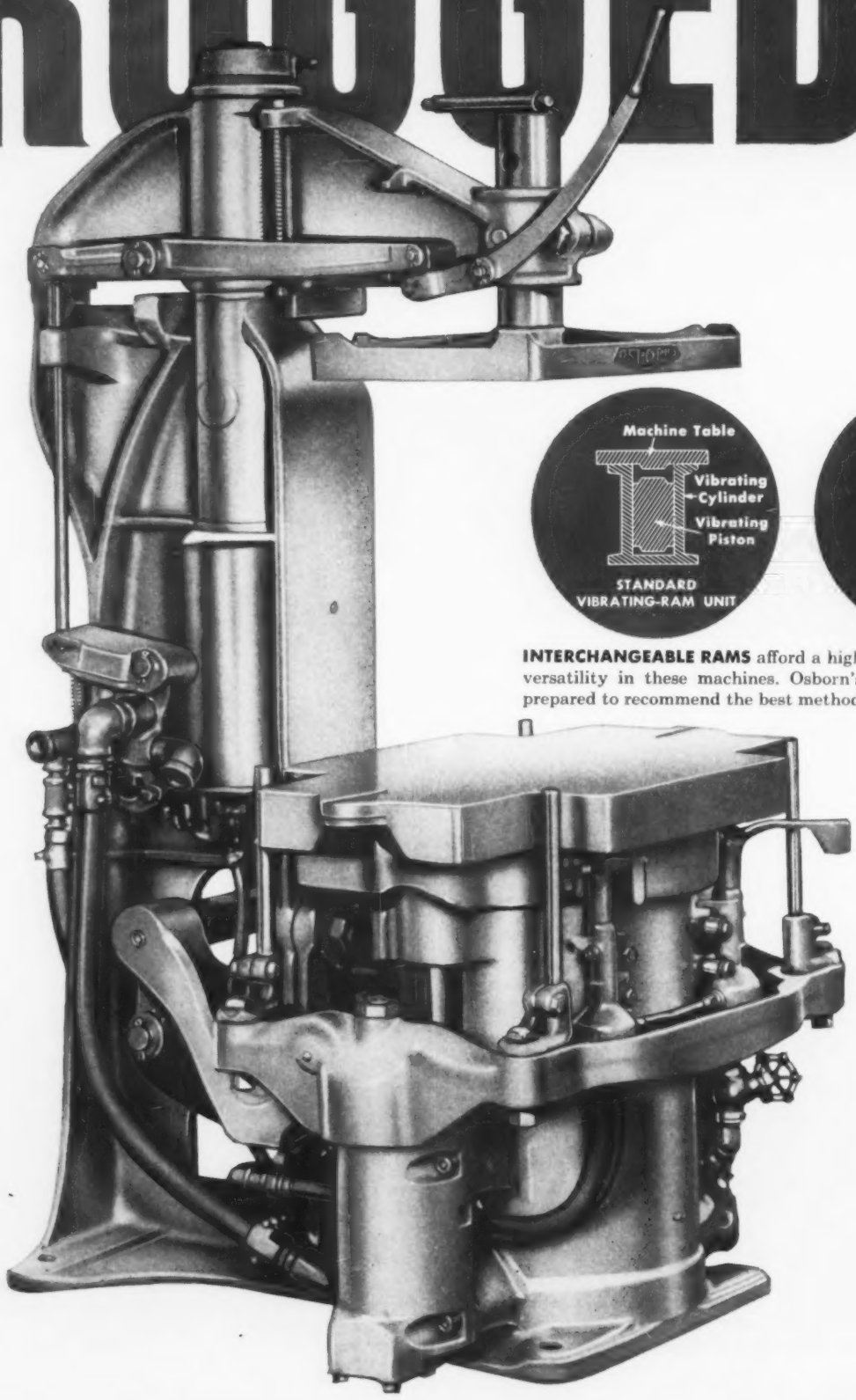
DRAVO

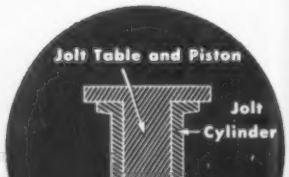
CORPORATION

DRAVO LURGI

Blast furnace blowers • boiler and power plants • bridge sub-structures • cab conditioners • docks and unloaders • dredging • fabricated piping foundations • gantry and floating cranes • gas and oil pumping stations • locks and dams • ore and coal bridges • process equipment • pumphouses and intakes • river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

RUGGED...





INTERCHANGEABLE RAMS afford a high degree of production versatility in these machines. Osborn's Sales Engineers are prepared to recommend the best method for your work.

MEMBER FEMA

FLEXIBLE

Vibrating Squeeze Stripper and Jolt Squeeze Stripper machines . . . engineered for dependable, precision molding performance by OSBORN

Designed and built around a single basic, dependable machine—today's complete line of Osborn Vibrating Squeeze Strippers and Jolt Squeeze Strippers gives the foundryman a choice of ruggedly-built units with the flexibility to handle a wide range of molding requirements.

In addition to the optional features shown below and the choice of vibrating-ram or jolt-ram actions—there are other important advantages in the line:

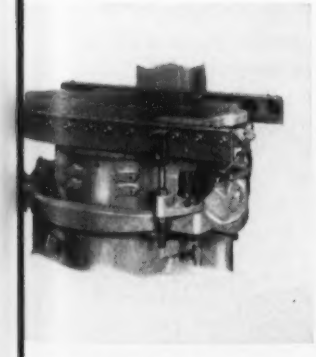
- Oil-controlled pattern draw with automatic acceleration from slow to fast . . . and automatic cushioning. Draw stroke is adjustable for any length of travel up to maximum—and for speed of slow draw. Pattern vibrator control can be set for required vibrating intervals—automatic synchro with the draw mechanism.
- Lifting pins adjustable for an extensive range of flask shapes and sizes . . . carried on cast draw frame. Equipment design demands that all draw mechanism parts function with uniform accuracy.
- Machines are available with squeeze cylinder diameters of 12″, 14″, 16″, 19″ and 21″ sizes.

In foundries throughout the country today—both types of all Osborn Squeeze Stripper models are on the job . . . producing at lower cost, higher-profit.

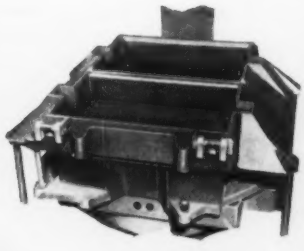
For full details on your applications—call in your Osborn Foundry Specialist to discuss your plans and problems soon. Write *The Osborn Manufacturing Company, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

WRITE FOR YOUR COPY . . . Folder No. 71-A gives complete specifications, operating data, applications and design features on the Osborn line of Vibrating Squeeze Stripper and Jolt Squeeze Stripper machines.

THESE OPTIONAL FEATURES FOR ALL MODELS . . . GIVE ADDED FLEXIBILITY

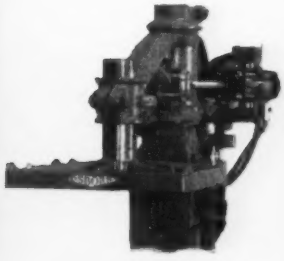


Roll-on, Roll-off Stripping rails



Cope and Drag Simultaneously

Single Push-Button Automatic Control Panel



Power-Operated Squeeze Head

leader in mechanization for the foundry

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MOLDING MACHINES • CORE BLOWERS • SHELL MOLDING MACHINES • BRUSHING MACHINES • INDUSTRIAL BRUSHES

Jet brake cup — LS-53
Synthetic lube diaphragm — LS-53
Diesel equipment seal — Viton
Drop-off tank seal — LS-53
Chemical pump liner — Viton
Natural gas valve diaphragm — Viton

For advanced fuel...hydraulic...lube systems,

New materials prove ideal in handling temperature extremes −350° F. to +750° F.

Working with two remarkably versatile elastomers, C/R Sirvene engineers are producing flexible molded parts for many vital fuel, lubricating, hydraulic and pneumatic systems. One, Viton-A*, can be compounded to produce parts that function dependably at 600° F., and for short periods up to 750° F. The other important feature of Viton compounds is their excellent resistance to corrosive chemicals, chlorinated solvents as well as both synthetic and petroleum base fuels and lubes. At the other extreme, C/R compounded Silastic LS-53** parts are providing low temperature operation down to -80° F. They also exhibit excellent resistance to synthetic and petroleum base fluids up to 350° F., and function well in propane up to 500° F. For temperatures as low as -350° F., C/R recommends Teflon* compounds.

C/R Sirvene engineers have an intimate knowledge of these elastomers. They also have perfected special techniques in processing which still further improve the physical properties of the molded parts. If your problem involves high or low temperatures, close tolerances, and compatibility in advanced design fuel, lubricant or hydraulic systems, get in touch with us at once. We have the skill and the facilities to help you.

* DuPont registered trademark
**Dow-Corning registered trademark

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C/R PRODUCTS: C/R Shaft & End Face Seals • Sirvis-Conpor mechanical leather cups, packings, boots • C/R Non-metallic gears

C/R

Cost-Cutting Ways to Improve Plant Maintenance Programs

By **Marshall Dyer**—Asst. to the President, Trundle Consultants, Inc., Cleveland

Efficient plant maintenance hinges on good planning, wise scheduling, and proper execution of assignments. Here are cost-cutting ideas you can apply to all three functions.

▪ Even small improvements in planning, scheduling and executing plant maintenance functions can bring big savings.

The first step in achieving these economies is to know what your present maintenance program involves, and what it costs. The record needn't involve a lot of clerical work, but it should tell you which equipment has a high proportion of maintenance cost and downtime, and it should show the overall extent and status of various inspection and repair functions.

Spot Key Areas—With accurate, up-to-date data in hand, you can start to tighten maintenance planning, scheduling and execution in those areas where the record shows the biggest opportunities for better efficiency and bigger savings.

Maintenance planning starts with the selection and proper installation of good equipment. It then extends to subsequent inspection and upkeep, and includes everything from minor repairs to major overhauls.

Good planning also means writing up step-by-step procedures for inspecting and maintaining equipment. These written standards should also designate the tools required for each step, and the length of time each job should normally take.

Schedules Save Time — The scheduling phase of the program determines when maintenance should be done and in what sequence. The object is to make full use of maintenance personnel, minimize overtime work, and prevent equipment downtime.

Lack of a detailed schedule causes many plants to waste as much as 75 pct of their maintenance labor. It's not that the workers are lazy or incompetent. Mostly it's due to poor management of the maintenance function.

If you doubt this, make 20 random visits to areas in your own plant where you can expect to find maintenance workers. Note in each case whether they are traveling,

CLOSE CONTROL: Reviewing equipment cards for next week's maintenance schedule are S. N. Schlein, plant manager (left), and Carl Haas, maintenance foreman at Fanner Mfg. Co. Div., Textron, Inc., Cleveland.

How Good is Your Program?

1. **Are the maintenance shop and store room neat and orderly? This encourages personnel to do precision work.**
2. **When was the plant lighting system last serviced and cleaned?**
3. **Do maintenance supervisors do the tricky jobs themselves instead of upgrading subordinates?**
4. **Are relations between maintenance and production supervisors friendly? Guarded? Openly critical?**
5. **Can you make immediate repairs on critical equipment or are you at the manufacturer's mercy?**
6. **Are you using a single record form to (1) schedule maintenance work, (2) report when it's complete, (3) collect cost data?**
7. **Do you control pilferage of maintenance supplies effectively?**
8. **Look at your plant and equipment as if you were a prospective buyer. What shape is it in?**

WORK SAVER: Maintenance man at Fanner Mfg. plant replaces copper tubing on press with new leakproof, vibration-resistant plastic hose.

waiting, or actually doing a job. And don't be too surprised if you find something less than top efficiency.

Schedule Most Work — How much maintenance work can you schedule profitably? It varies somewhat, but in most companies it can be 80 to 90 pct of the total. Good planning and scheduling go together, and the combination should be geared to give you the best possible return on your maintenance investment.

It may benefit you to give the maintenance group sales forecasts for various products. There's no point in lavishing maintenance care on specialized equipment used to make short-lived product designs. Put the effort into machines that make the same things year after year, and keep it up as long as they're not technologically obsolete.

Guard Key Machines—The company struggling to maintain profits should probably limit preventive maintenance to machines that will seriously affect production or safety if they break down. Another cost-cutting tip: Schedule only those jobs that have mandatory deadlines for completion; other work can be kept as a backlog to fill unexpected slack periods.

Effective work authorization is essential to keep scheduling on an efficient, economical basis. Every order for jobs that will run over $50 or so should show the estimated cost and why the job is necessary.

Work authorization orders also discourage the flood of personal-favor requests that plague many maintenance departments. It is very hard for a maintenance superintendent to turn down one of these from an executive who outranks him. But a work-authorization system exposes such requests.

Skip Other Jobs—Work authorization also pinpoints other non-maintenance jobs such as the making of tools and furniture which should be purchased, or work on capital improvements which should be handled by outside contractors.

PLUG-IN MACHINES: For easier maintenance at Split Ballbearing Div. in Lebanon, N. H., compressed air, gas, electric power and coolant connections are mounted behind machines on 5-ft high stanchions.

Maintenance suffers when the staff has to take on these extra duties.

A complementary technique to work authorization is work measurement, whereby the amount of time taken to do a job is compared with an established time-study standard. Neither tradition nor individual whim can be a sound basis for judging what is a fair amount of time to do a specific maintenance job.

Proper maintenance supervision can also save you money. It is much harder to supervise maintenance personnel than to supervise direct workers. Because maintenace is plantwide, supervisors need a clear understanding of every phase of production, plus a wide variety of skills, and basic knowledge.

Aids for Supervisors—In some plants supervision is spread too thin for effective control. But more supervisors are not always needed. Quite often, a better telephone system and a better routine will let existing supervision cover more ground.

Better maintenance procedure—the details of actually getting the work done—is still another fertile area for savings. Many companies study their routine jobs to find the easiest, fastest, most efficient ways to handle them.

Maybe certain maintenance work can be mechanized. Spray-painting equipment, steam cleaners, industrial vacuum cleaners, centralized lubrication systems and many other devices can often reduce costs and do a better job. Permanent catwalks, hoists, and ladders may also be wise investments for routine maintenance; it takes time to carry and set up portable equipment.

Test New Products—New products can be keys to maintenance savings, too. New and improved lubricants, protective coatings, cleaners, paints, and equipment items often provide a basis for improved methods.

And don't discount creativity and imagination applied to the maintenance function. Sometimes the operation of a machine can be vastly improved with no more effort than would ordinarily go into its repair.

Current rewards for good maintenance will become much larger in the next decade as automatic manufacturing becomes more prevalent. Under automated conditions, the largest items of cost affecting profits will be maintenance and downtime losses. Obviously, now is the time to start thinking about maintenance efficiency and economy.

This is the fifth in a series of articles on ways management can cut costs. Previous articles dealt with materials, plant layout, manufacturing and quality control.

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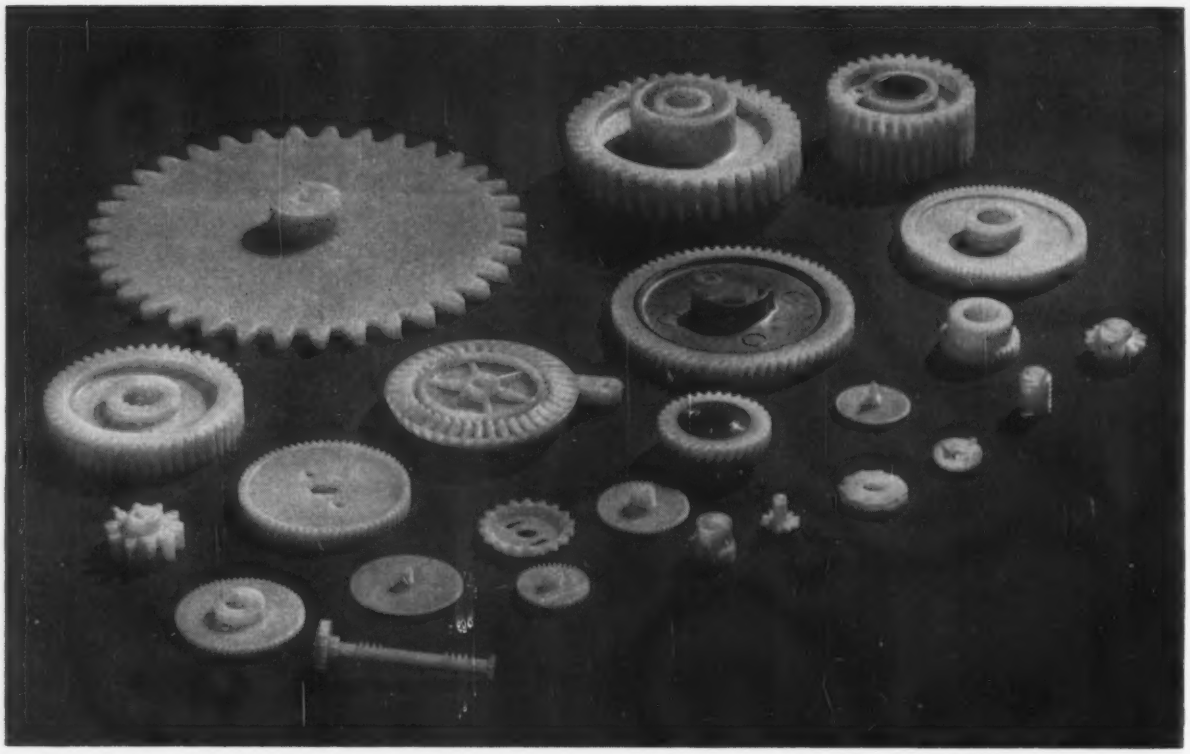


CANDIDATE FOR GEARS: Good fatigue, tensile and impact properties suit Delrin to many gear applications.

Dense Plastic Resists Impact

A new plastic engineering material features metal-like mechanical properties.

Evaluations have turned up many performance and production advantages.

▪ Aimed at improving product design at less cost, a new rigid thermoplastic is said to be the first plastic with strength properties approaching those of nonferrous metals.

Known chemically as a linear acetal resin, the material is a highly crystalline polymer. Its dense structure accounts for many of its key properties.

Resulting from a 10-year research program at E. I. du Pont de Nemours & Co., Inc., Wilmington, the product is called Delrin. Its main challenge is in the field now dominated by diecast metals.

Field Tests Prove — During the past three years, du Pont has supplied quantities of the material on a test basis to over 250 companies representing every major industry. First tests have covered a wide range of products from automotive instrument housings and window cranks to gears, bushings and bearings.

With both static and dynamic coefficient of friction being 0.08 against steel, it's particularly valuable for intermittent bearings, where smooth stopping and starting is a must.

Though hefty compared to most other plastics, Delrin is lighter than any of the diecasting alloys: 80 pct lighter than zinc, 45 pct lighter than aluminum, and over 20 pct lighter than magnesium. While on a pound-for-pound basis, it's more than seven times the price of zinc, it emerges as a strong competitor in terms of the final cost of a product.

Cuts Finishing Costs—In fact, if extensive finishing is required, the balance often turns in the favor of Delrin. For example, refrigerator door handles can be supplied in colored Delrin at 20 to 25 pct below the price of chrome plated zinc diecast handles.

Initial price per pound of Delrin is expected to be 95¢. After build-up of sales values, the price will possibly drop to 85¢.

In the case of fuel pump and carburator parts, the material will operate for long periods at temperatures of 250°F. It has excellent resistance to gasoline, motor oil, brake fluid, alcohols, glycols, ketones, esters, aldehydes and others.

Aerosol containers with wall thickness of 0.045 in. will hold formulations with no distortion. Even after a year they still contain enough propellant to discharge the contents completely.

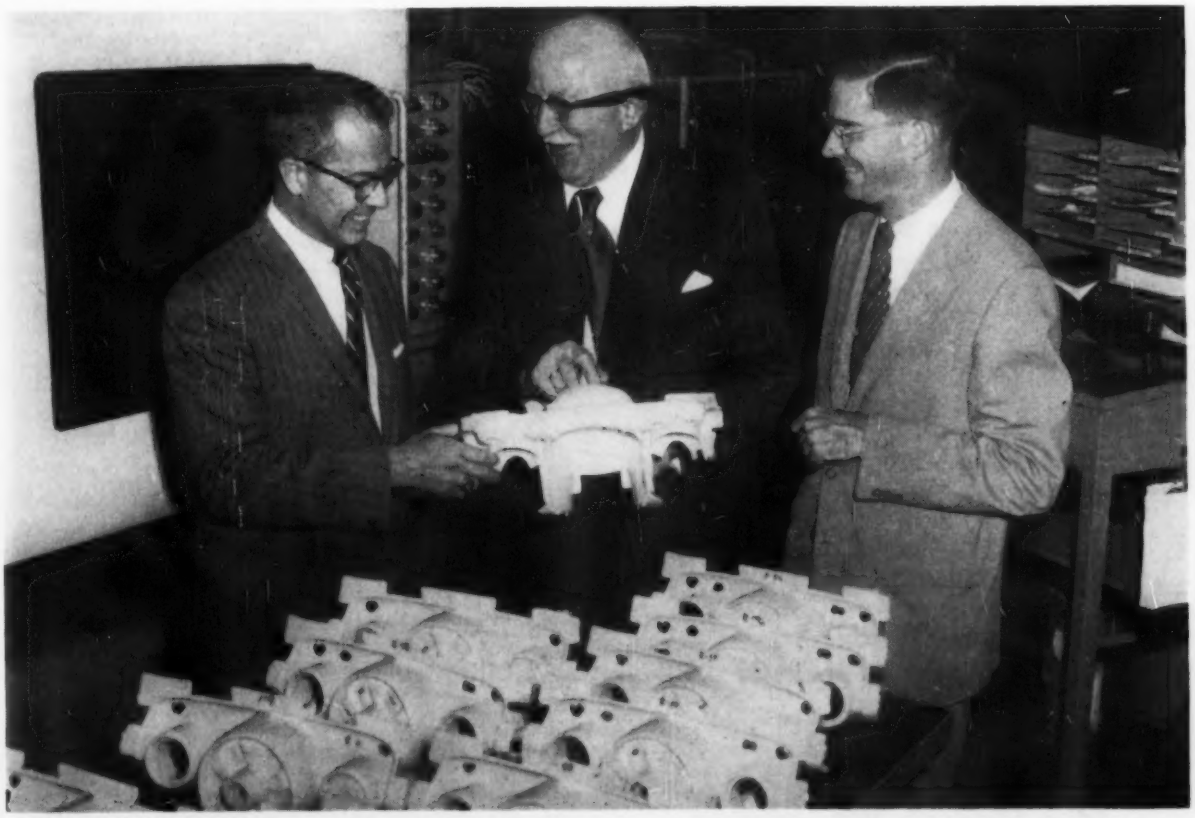
Dense Crystals—Being a linear polymer, Delrin is made up of unbranched chains that form into very dense crystals. It places the material in the middle ground between plastics and metals.

Standard plastics equipment can process the material at mass production rates. In addition, Delrin can be screwed, nailed, sawed, drilled, machined, painted, metallized, or printed.

Soon to be in commercial production are two major compositions: Delrin 500 is for general purpose molding. High-viscosity Delrin 150 will serve for extrusion of tubing, sheeting and rod.

Acetal Resin Withstands Rugged Service

ASTM Test No.	Property	Average Values
D638	Tensile strength and yield point at 73° F, psi	10,000
D638	Tensile strength and yield point at 158° F, psi	7500
D790	Flexural modulus, 73° F, psi	410,000
D790	Flexural strength, psi	14,000
D732	Shear strength, psi	9510
D648	Heat distortion temperature, 264 psi, °F	212
D648	Heat distortion temperature, 66 psi, °F	338
D621	Deformation under load (200 psi at 122° F), pct	0.5
D695	Compressive stress at 1 pct deformation, psi	5200
D570	Water adsorption, 24 hours immersion, pct	0.12
D792	Specific gravity	1.425
D785	Rockwell hardness	M94, R120
D635	Flammability, in./minute	1.1
	Melting point (crystalline), °F	347
D569	Flow temperature, °F	363
D696	Coefficient of linear thermal expansion per °F	4.5×10^{-5}
	Thermal conductivity, Btu/hr/ sq ft/°F/in.	1.6
	Specific heat, cal/gm	0.35



RESEARCH PAYS OFF: Nobel Prize winning German chemist, Hermann Staudinger, pioneer in the field in the 1920's, examines instrument housings with Du Pont directors F. C. McGrew and Irenee du Pont, Jr.

Why Price-Level Depreciation?

By L. T. Welsh—Partner, Arthur Andersen & Co., Chicago

There are a number of ways of looking at the problem of depreciation reform. To some, price-level depreciation is the most logical.

From a professional accountant, here are the reasons for the price-level approach to depreciation reform.

▪ It's too bad business capital can't be expressed in something like bushels of wheat.

Then depreciation objectives would be clear. Nothing is gained until more bushels are reaped than were sowed.

The "grain" sowed by business is capital. Depreciation is simply the means of recovering what has been sowed.

In business terms, the objective of depreciation is to return the capital consumed in operations.

Capital Is Not Dollars—Because capital is invested in many diverse items, we must use dollars to express it. It is important that those dollars fairly represent the tangible items because **capital is not dollars.**

Capital is buildings, machinery and equipment, and natural resources—to which labor is added to create products. The investor has his choice about when and where to invest. But when he decides, he commits a certain amount of purchasing power. No profit exists unless the same amount of purchasing power is returned. Depreciation is that return of capital.

Pricing Realistically — To price depreciation realistically, dollars must be related to purchasing power. The only substantial meaning a dollar can have is the quantity of tangible products or services it will buy. And today's dollar has less than half the purchasing power of a 1940 dollar.

In fact, many economists who have researched the causes and history of inflation forecast that inflation will continue on a long-range basis. This forecast only emphasizes the importance of dealing with inflation which has already occurred. It is not too late to recognize its effect on undepreciated facilities.

Failure to do so will result in overstated profits in future periods

Pricing Depreciation in Today's Dollars

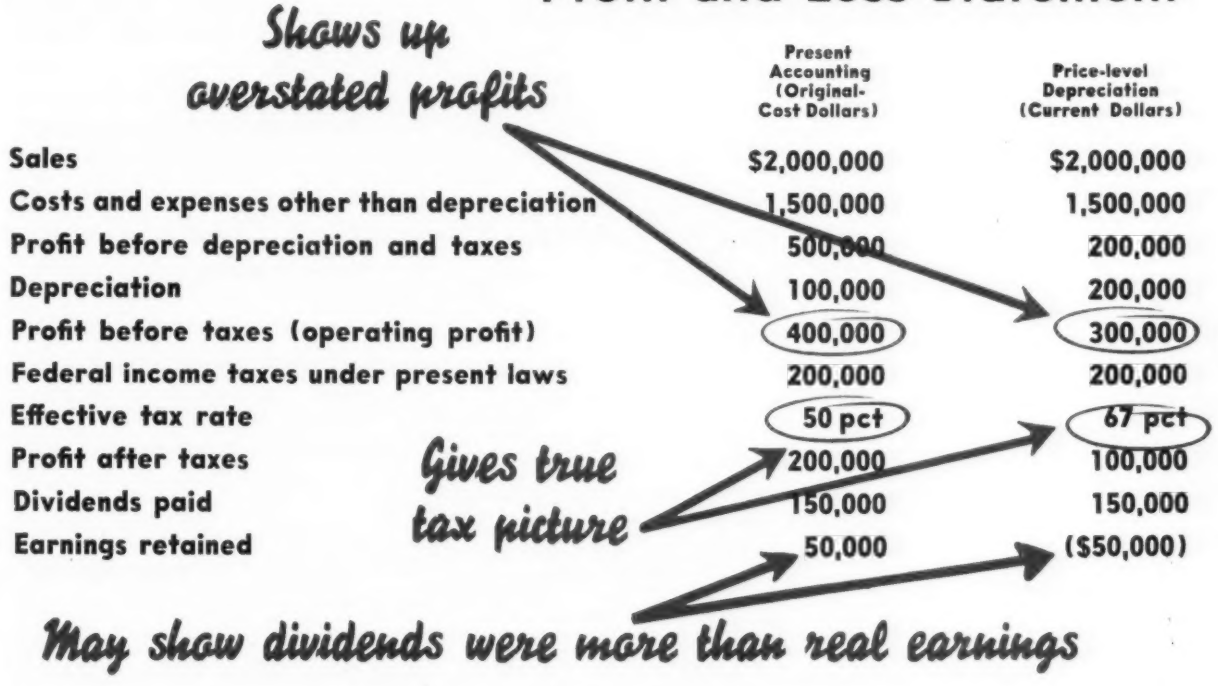
Item	Original Cost Dollars	Current Dollars
1 Year acquired	1940	Same
2 Useful life	25 years	Same
3 Price		
At original cost—1940 dollars	$50,000	
At today's dollars (230 pct of 1940 dollars)		$115,000
4 Yearly depreciation (Item 3 divided by Item 2)	$ 2,000	$ 4,600

What inflation did to original dollars

What's put aside for return of capital

What's really needed to return purchasing power

How Price-Level Depreciation Affects Profit and Loss Statement


Shows up overstated profits
Present Accounting (Original-Cost Dollars)
Price-level Depreciation (Current Dollars)
Sales $2,000,000 $2,000,000
Costs and expenses other than depreciation 1,500,000 1,500,000
Profit before depreciation and taxes 500,000 200,000
Depreciation 100,000 200,000
Profit before taxes (operating profit) 400,000 300,000
Federal income taxes under present laws 200,000 200,000
Effective tax rate 50 pct 67 pct
Profit after taxes 200,000 100,000
Dividends paid 150,000 150,000
Earnings retained 50,000 ($50,000)
Gives true tax picture
May show dividends were more than real earnings

of inflation and understated profits in future periods of deflation, thus adding impetus to the trends.

How Much Inflation?—The question is sometimes asked, "Has inflation in the United States reached the stage which warrants consideration in determining depreciation for financial reporting and Federal income tax purposes?" The fact is that it takes over two dollars today to buy what a dollar would buy in 1940.

When computing current depreciation of capital items purchased in 1940, original-cost dollars must be converted to today's dollars. Only by providing more than twice as many dollars for depreciation, will as much capital as was invested be returned. How this so-called "price-level depreciation" works is shown in the table, left.

Converting Historical Dollars—The converting of 1940 and other historical dollars to today's dollars is mechanics and presents no accounting problem. Any one of several indices may be used, such as the implicit price deflator for gross national product, the consumer's price index, etc. All will give about the same result. It is only important that the index fairly reflect the change in purchasing power of the dollar.

Incidentally, the U. S. Department of Commerce, in its reports of gross national product, industrial production, weekly wage earnings, etc., converts historical dollars to current dollars. Our Federal Government thus recognizes the effect of inflation, but not in the case of depreciation allowances for Federal income tax purposes.

Certainly the same indices should be used in times of deflation. In this case, **fewer** dollars need be charged to depreciation to return the purchasing power of capital consumed.

"Replacement" Misunderstanding—There is a common misconception that the current value of the dollar should be determined by replacement costs in pricing depreciation.

Construction costs, for example, have risen more rapidly than the prices reflecting the **over-all** change in the purchasing power of the dollar. Depreciation based on construction prices would be greater than the amount required to return the purchasing power of the capital invested.

This explains why the replacement basis of depreciation is subject to attack. Its opponents claim that facilities are replaced with those having greater production usefulness.

Such an attack cannot be made on depreciation which returns the same purchasing power originally invested.

Deny Full Return—The replace-

How Price-Level Depreciation Affects the Balance Sheet

Capital	Present Accounting	Price-Level Dep. Account.
Capital stock	$1,500,000	$1,500,000
Excess of depreciation on price-level basis over cost basis since Jan. 1, 19..*	*This will drop during deflation*	100,000
Earned surplus (earnings retained)	500,000	400,000
	Differences show up here	
Total capital	$2,000,000	$2,000,000

*Date price-level policy adopted.

ment basis of depreciation—as it is being advocated by some proponents—would deny full return of capital to the investor unless he actually reinvests in the replacement of facilities. Actually, an investor should have the right to choose **any** means he wishes of reinvesting capital returned.

There is a tendency to obscure the real objective of depreciation by the advocates of methods based on expediency.

"Fast depreciation" is a term often used for the declining balance method, the sum-of-the-year-digits method and five-year amortization which have been permitted for tax purposes. Fast depreciation permits deductions to be made sooner, but does not permit more depreciation than original dollars spent. Accordingly, fast depreciation does not substitute for price level depreciation.

Effect On Financial Statements —Both balance sheet and statement of profit and loss are affected when price-level depreciation is used.

Assume that price-level depreciation for a given period on all depreciable assets of a business amount to $200,000, compared with $100,000 of original cost depreciation on the same assets. The comparative effect on profits, before and after taxes, is shown in the table on p. 145.

This chart illustrates two important deficiencies in present accounting which recognizes only original cost dollars in the preparation of financial statements. First, operating results are overstated. Second, dividends may exceed real earnings and therefore dividends may be paid out of capital.

The chart shows also that the effective tax rate is substantially greater than the rates quoted in our tax laws.

The balance sheet would differ only in the capital section. Using the depreciation amount shown in the top table on p. 145, it would appear as follows at the end of the first year, see table above.

The excess of $100,000 shown above may be reduced during periods of deflation by the amount original-cost depreciation exceeds price-level depreciation.

Analyses Are Helpful — Some companies have analyzed capital over a long period to determine the effect of inflation. This is determined simply by applying the appropriate index to each change in the capital accounts. Too often, the results show that earnings retained under present accounting have been partially or completely consumed by inflation. Such analyses are helpful in many ways. But their most important function is to emphasize the need to adopt price-level depreciation as a means of recognizing capital erosion.

The adoption of price-level depreciation would have a significant effect on the operating results reported in the financial statements of many companies.

Far-reaching Effects—The effect is far-reaching because the same financial statements are used by (1) investors as a basis for buying or selling stock, (2) labor and management in important negotiations, (3) corporate directors in evaluating management performance, (4) management and competition as a guide in determining selling price to consumers, (5) banks and other organizations in loaning funds, (6) Federal and local governments in fixing public utility rates and in gathering statistical information upon which tax and other public laws are formulated, and (7) many others who find the need for reports of business profits.

The basic issue is an important one — whether price-level changes are to be recognized in order to fulfill the objective of depreciation.

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Welded Bed, Modular Design Strengthen Powerful New Lathe

Built to machine the toughest metals with speed and accuracy, this new lathe features modular design and all-welded steel construction.

▪ Modular design couples a separate, built-to-the-floor headstock to an all-welded steel bed in the powerful new Clearing-Axelson Blue Chip lathe just announced by Clearing Div., U. S. Industries, Inc.

The headstock, which is also of welded-steel construction, is a completely independent unit. It contains all the drive and feed mechanisms for the lathe, plus all of the electrical equipment. It also serves to mount the operator's console.

Any Length Bed—A thick, extra-wide mounting flange on one side of the headstock couples to a similar flange on one end of the lathe bed to insure maximum strength and rigidity. Beds of varying length or style may thus be joined to the headstock at any time.

The modular or "building-block" construction principle extends to every major component of the independent headstock as well. Drive gearing, the quick-change gearbox, and the electrical control module may be disassembled as complete units to simplify servicing.

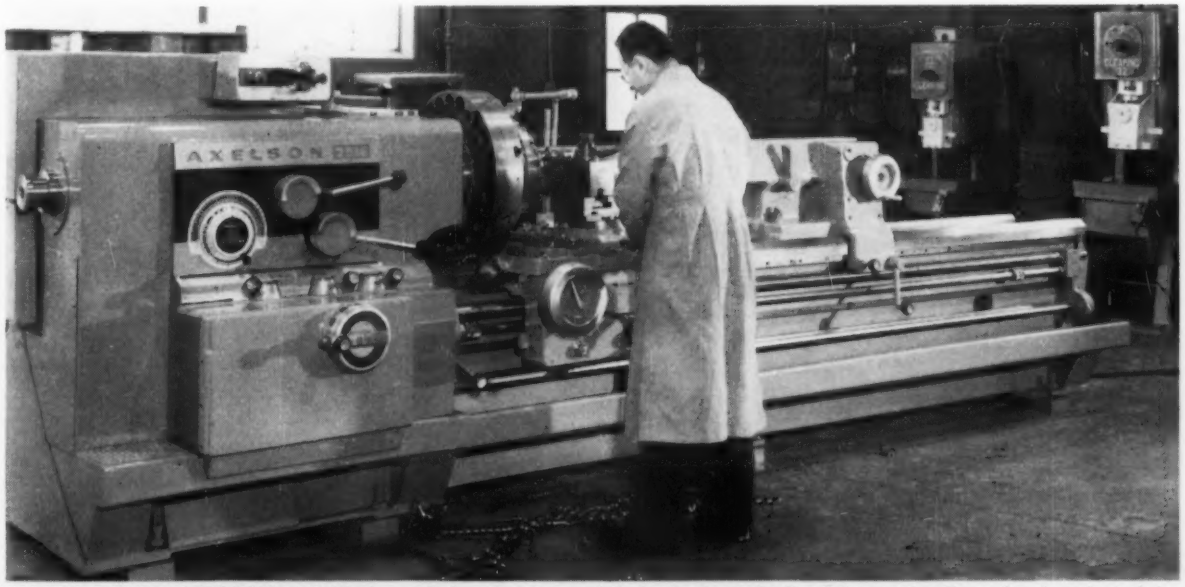
Quick-Change Features — Forty spindle speeds are provided in closely-spaced steps up to a maximum of 2000 rpm. Speed and feed control levers are closely grouped for easy manipulation and are color coded for operator convenience. Power assisted shifting and full power shifting are optionally available. A unique rotary slide rule picks the right code for speed-feed changing.

On the Model 2516 lathe pictured below, a 50-hp motor delivers torque to the spindle through steel-cable V-belts. Clearing officials say the lathe will do "rough threading and take heavy interrupted cuts without perceptible vibration or chatter." There are 88 carriage feeds and threads available.

Rigid Bed Design—The welded steel bed is continuously reinforced from end to end, with the pedestal, bed and ways built as an integral unit. The front wall of the bed—which takes most of the cutting-load force—extends all the way to the floor. The chip pan extends well forward to give added strength to the overall structure.

As it stands, the design of the Blue Chip line represents Clearing's effort to meet the demands imposed by superalloys and modern carbide and ceramic cutting tools. From the beginning, the welded steel design was planned to be far more rigid than conventional cast construction.

The model shown here has a swing diam of 25 in. over the ways, 16 in. over the cross slide.



EXTRA-RIGID DESIGN: Welded steel headstock and lathe bed are built right to the floor for heaviest duty.

Furnace Design Promotes Uniform Carburizing Quality

By H. F. Coyle and M. E. Lackey—Leeds & Northrup Co., Philadelphia

Good carburizing quality requires a careful balance of basic factors.

Here are some pointers on how furnace design helps to determine product quality.

▪ There have been a number of significant changes in gas carburizing in the past ten years. All have been in the direction of improving quality, controllability, and reproductibility. They have resulted from a better understanding of the effects of four basic factors on the process. These key factors are temperatures, time, and quality and quantity of carburizing medium.

Only in recent years has equipment been available to measure and evaluate the interaction of these variables during a carburizing cycle. As a result, much has been learned about the influence of furnace design, temperature, and atmosphere control systems.

Two Essentials — Heat distribution within the furnace work chamber depends largely on furnace design. Temperature is regulated by a temperature control system. Both are essential for good temperature uniformity.

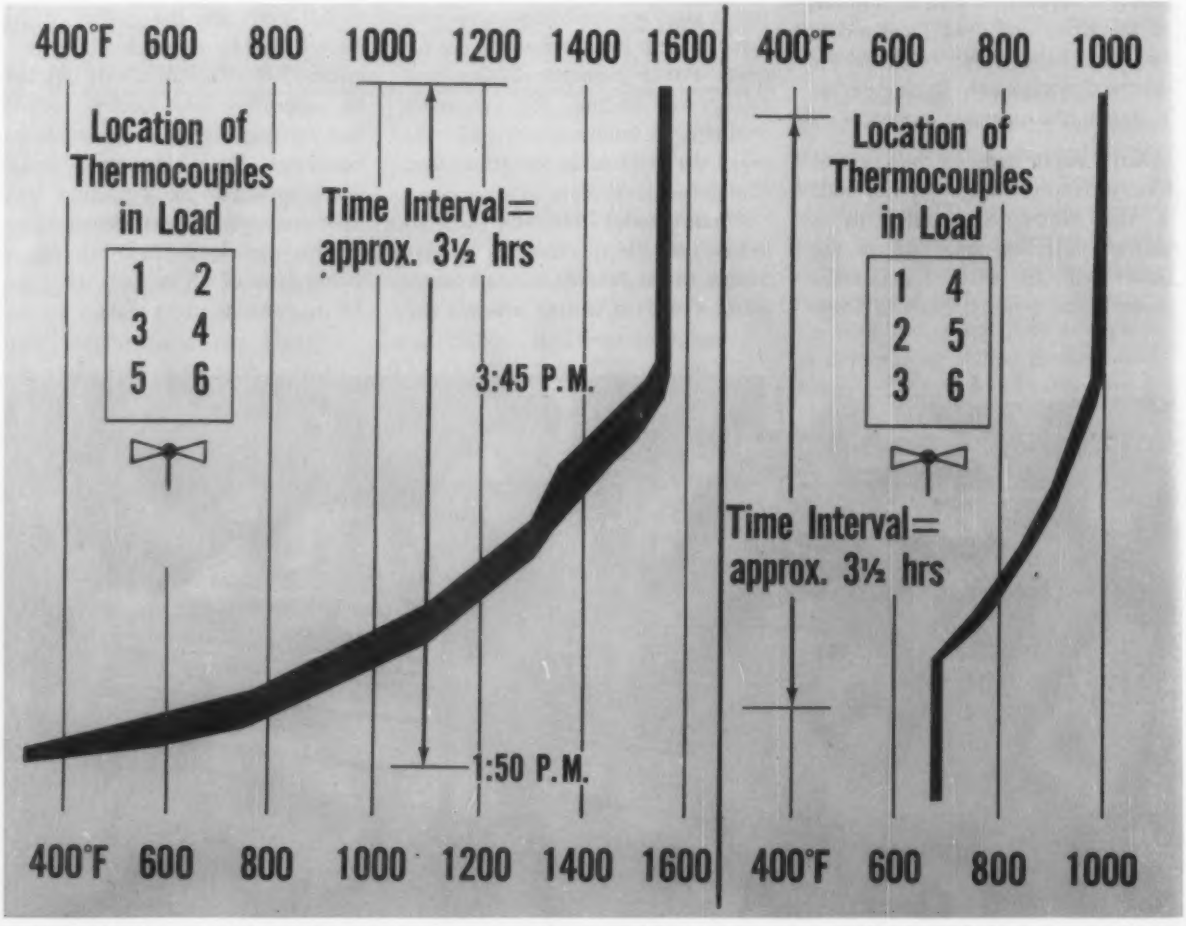


FIG. 1a: In the carburizing and hardening range, maximum spread approaching temperature is only 75°F.

FIG. 1b: In a convection-heated furnace, maximum spread in coming up to tempering temperature is 30°F.

Many batch-type furnaces depend solely on radiation to transfer heat to the work. But to insure good heat distribution and thorough mixing of the atmosphere gas, convection is also essential. This means the atmosphere should be circulated by a fan in a closed path. In this way, it passes evenly over each part in the load throughout the depth of the work space. Any openings—such as perforated holes in the size of the work container—destroy the closed path of circulation and promote a non-uniform condition.

Good Circulation — Proper balance between heat input and fan capacity is also essential to prevent build-up of a heat head between the elements and the parts around the sides of the work tray. As the volume of heated gas forced through a load is directly proportional to the tip speed of the fan, the fan should be of adequate diameter.

Design-wise, it has been found that when the heaters surround the sides of the work space, there is a short closed path of circulation that minimizes transfer heat losses. With the fan located directly beneath the work space, a swirling action is created which helps heat distribution.

When coming up to heat in any furnace, it is best to limit temperature spread between different parts of the load to a minimum. This insures temperature equilibrium throughout the entire load in the shortest time after reaching the control setting.

Close Control—If a furnace is properly designed (that is, capable of heating uniformly), how it performs depends on the temperature control system. For example, Fig. 1 (a and b) shows the temperature uniformity possible in two convector-heated furnaces, one operating in the tempering range and the other operating in the carburizing and hardening range.

The maximum spread in chart B on coming to temperature is only 30°F. It is only 75°F in chart A at the higher temperature.

As applied to carburizing, why is this level of control important? Pri-

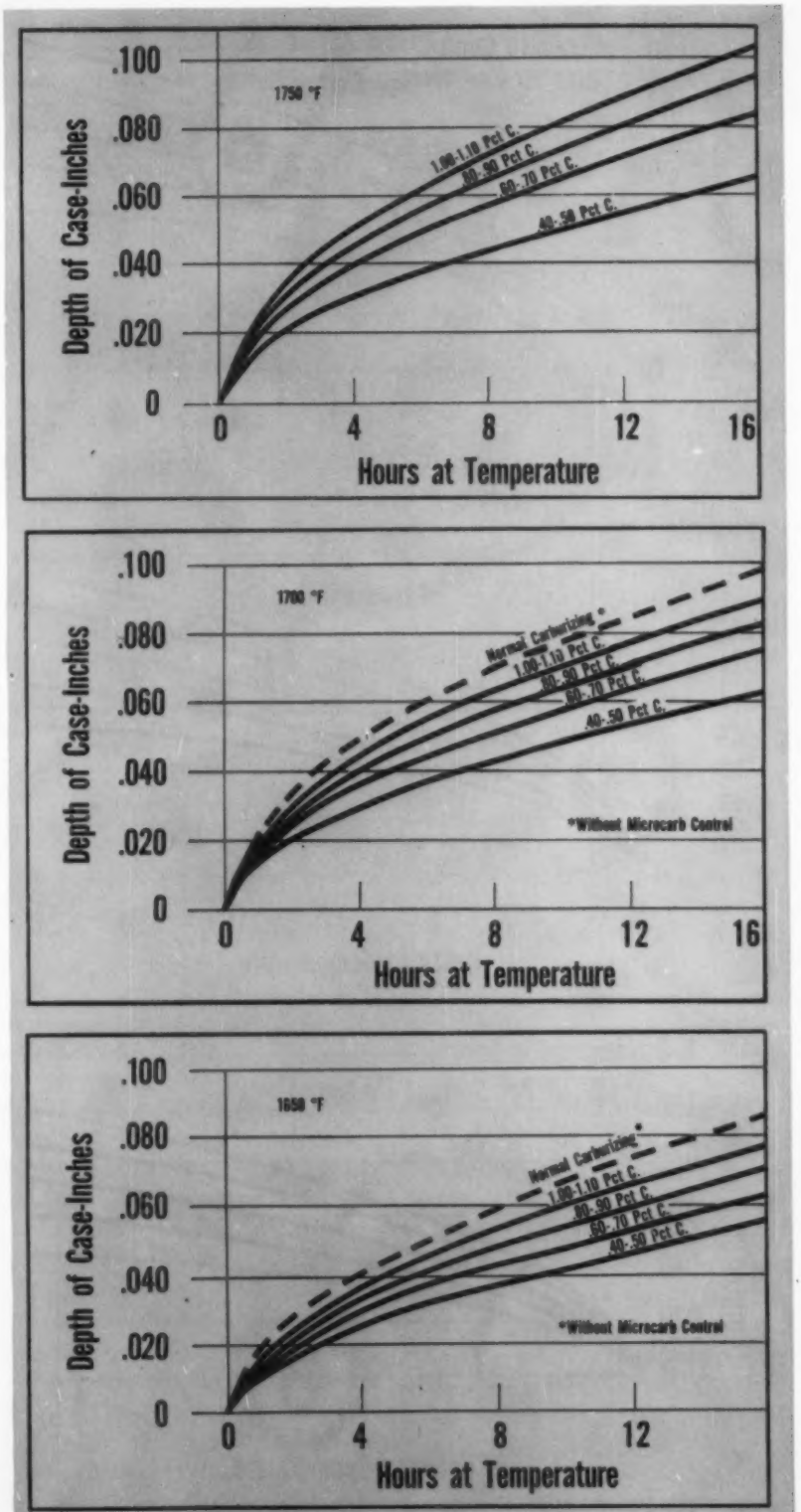


FIG. 2: Carburizing rates will vary as a function of temperature. Above are rates at 1650°, 1700°, and 1750°F. For each temperature level, values are plotted for varying carbon potentials ranging from a low of 0.40 pct to a high of about 1.00 pct. Carbon potential is controlled by controlling the furnace atmosphere. Here a Microcarb unit is used.

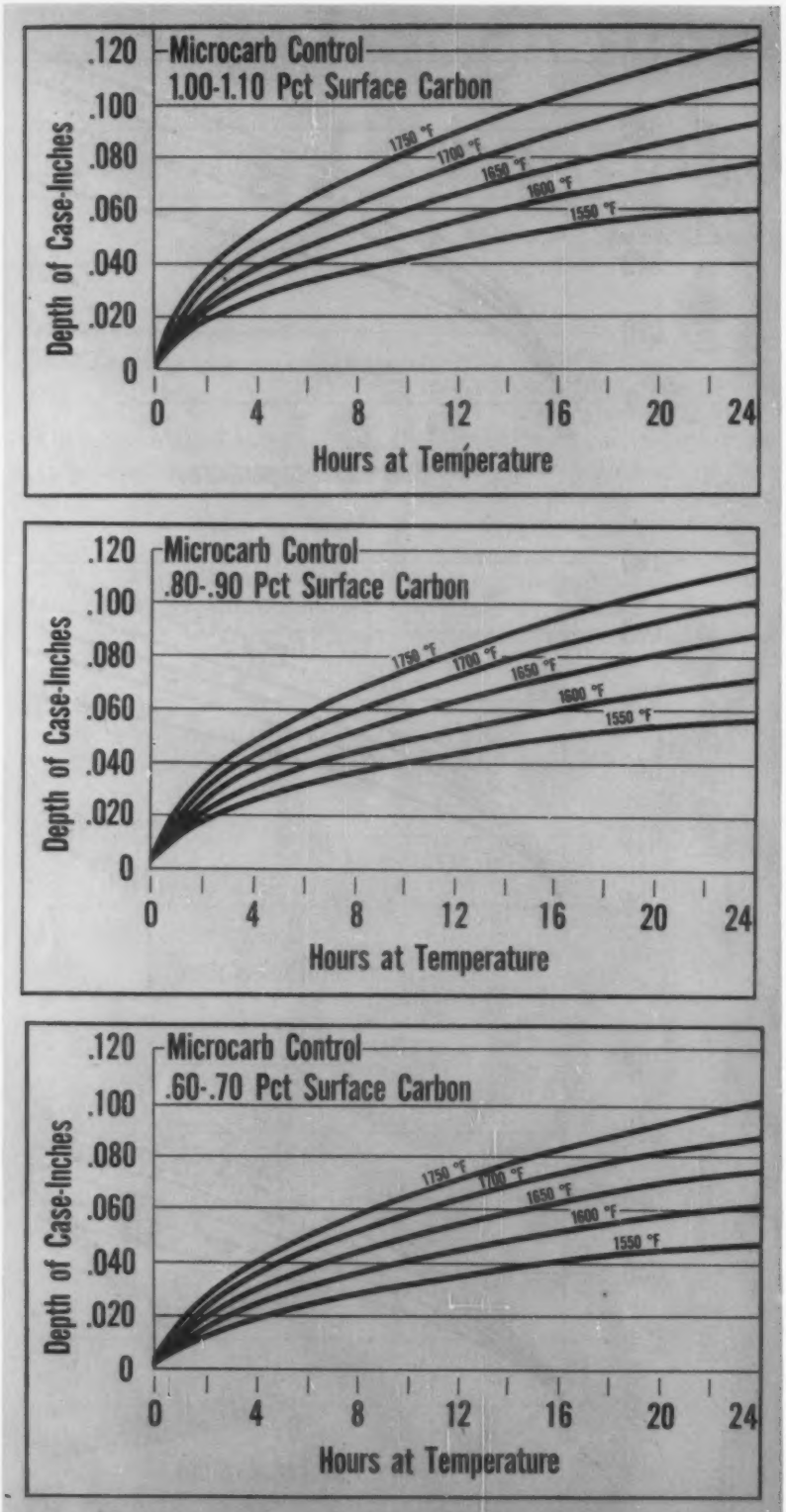


FIG. 3: Control of case depth is important in both carburizing and carbon restoration. Above are shown case depths that can be achieved at three levels of carbon potential. In each case, case depths are plotted for five different levels of carburizing temperature. By combining temperature and carbon control, case depth can be controlled accurately.

marily because carbon more than any other alloying element influences the mechanical properties of steel. In most cases, the carbon content of the surface of a part is the determining factor in how well the part performs in service. This makes adequate carbon control of the furnace atmosphere a practical necessity in meeting modern heat treating specifications.

Need Equilibrium — Carbon potential is the carbon in a furnace atmosphere available to diffuse into the work. Theoretically, carbon potential can be predicted by measuring atmosphere components such as methane, carbon dioxide, or moisture. Such measurements can give accurate indication of carbon potential only when a state of equilibrium exists. This means that there must be no transfer or flow of carbon into, or out of, the work surface.

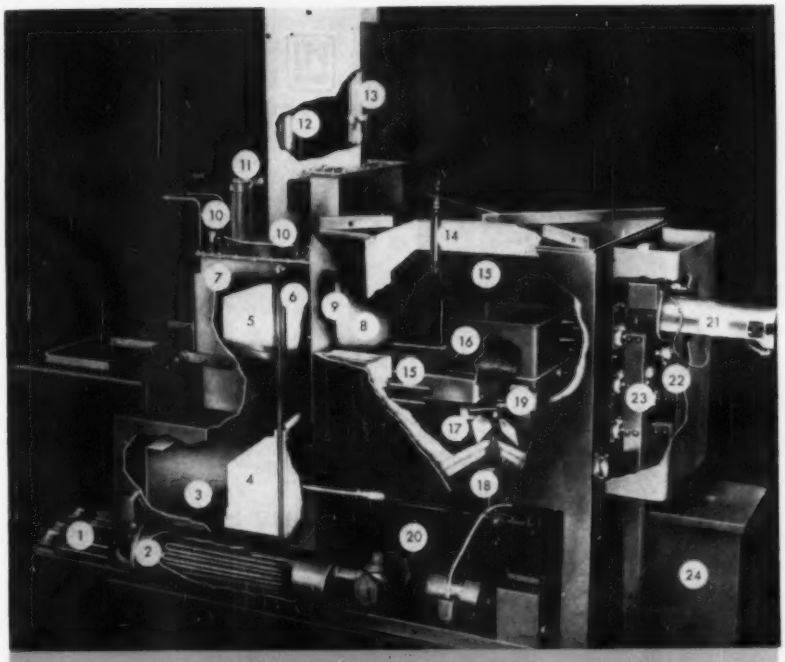
In commercial practice, true equilibrium is rarely attained because of variations in work surface, area, air leaks, catalytic effects, contamination, temperature, time, and gas flow. These factors make extremely difficult the correlation of gas composition measurements with carbon potential under production conditions.

One system available for direct and continuous measurement of carbon potential in furnace atmosphere is known as Microcarb control. It is a control system that is available with L&N furnaces.

Test Quality—To establish rates of carburizing and depth of carbon penetration in relation to temperature and time, tests were run with Microcarb control. Shown in Fig. 2 are the carburizing rates at 1650°, 1700°, and 1750°F where the carbon potential of the furnaces atmosphere is varied from 1.10 to 0.40 pct C. Fig. 3 shows rates of case carburizing and carbon restoration at temperatures from 1750° to 1550°F where surface carbon varies from 1.10 to 0.60 pct C.

These factors, relating to temperature uniformity and atmosphere

New Carburizing Furnace



1. Foot treadle
2. Heat exchanger
3. Quench tank
4. Work tray in quenching position
5. Work tray in charge position
6. Elevator
7. Protected atmosphere vestibule
8. Furnace door
9. Atmosphere port
10. Spark plug igniters
11. Pressure relief cap
12. Elevator air cylinder
13. Furnace door air cylinder
14. Fluid inlet
15. L-O voltage heaters
16. Work tray in heating chamber
17. Fan
18. Fan Motor
19. Hearth and work support
20. Oil circulating pump
21. Carbohm detector
22. Thermocouple
23. Temperature limit fuse
24. Transformer

control, are of utmost importance during the actual heating cycle. However, final mechanical properties and hardness are dependent on uniform quenching. Experience indicates that the same principles of uniformity that apply to convection heating also apply to quenching. A closed path with positive oil circulation is desirable so that all parts of the load are uniformly cooled in minimum time.

New Furnace — How can these uniformity factors be applied to production equipment Recently, L&N introduced a horizontal-type furnace with protected quench. This furnace incorporates the principles of convection heating, atmosphere control, and positive oil circulation in the quench. It is designed for operation up to 1900°F for gas carburizing, homogeneous carburizing, carbon restoration, and hardening.

The furnace has radiant tube, low voltage heaters, a refractory lining, and a ceramic hearth. A cast alloy fan is located directly below the work container. A solid side wall work container with grid bottom provides a short closed path for circulation of heat and furnace atmosphere.

Carbon potential of the furnace atmosphere is measured by a Carbohm unit. This is a loop of fine gage iron-carbon wire which is located in the work space adjacent to the control thermocouple. As carbon from the atmosphere passes in and out of the wire, it causes a change in its electrical resistance. The signal from the unit is transmitted to a controller calibrated directly in percent carbon.

Use Fluid—Atmosphere is generated by injecting hydrocarbon liquid through a pump onto a target located on the underside of the furnace roof. The heat of the furnace gasifies the liquid. The fan thoroughly mixes the new formed gas and circulates it through the work load. A carbon controller automatically proportions the flow of hydrocarbon liquid to maintain the desired carbon setting.

The furnace has a integral quench under an atmosphere-protected vestibule. Thus the work is not exposed to air when moving from the heating chamber to the quench. Oil is circulated in the quench by a high pressure, centrifugal pump at a rate of 250 gpm.

At the time of quenching, the loaded work basket rests on a work support. Oil is pulled down through the load, then recirculated to a heat exchanger and back to the quench tank. In this way, the factors controlling uniformity during the heating cycle are extended to the cooling cycle.

Carbon Results—In a test of temperature uniformity, a 110-lb load of small parts (SAE 8620) was used. Six thermocouples were located at different points in the load. Temperatures were recorded on a multiple point Speedomax instrument.

Running at 1700°F for four hours at a carbon setting of 0.90 pct C, test shims were located at each corner, center, and top and bottom of the load. Tests on five shims showed very close carbon control, varying from 0.87 to 0.89 pct C. Another identical load was run to check case depth uniformity. Case depths on five specimens checked out at 0.035 to 0.036 in.

Hardness checks on fifteen samples showed a similarly uniform quality. Samples were taken from the top, bottom, and center of the load. All were quenched in oil. Hardness of all specimens ranged from Rc 63 to Rc 64.

Carbide Deposit Ups Tool Life

Are tool and die wear hurting you where straight carbide tools can't help?

Then take a look at a simple method that adds a layer of tungsten carbide to critical areas.

By R. H. Eshelman—
Engineering Editor

▪ Surfacing steel tools with carbide makes good sense. For many applications where costs, geometry or other factors rule out solid carbide tooling, the idea has held real appeal for many years. So far it has been mostly academic.

Processes developed for applying a layer of carbide have failed to catch on to any extent for economic or other reasons. Now it appears that an electro-discharge method may hold the answer.

It's a process that came out of research on unwanted transfer of electrode material to workpieces in spark erosion machining. On steel surfaces, the process deposits a fine layer of tungsten carbide which becomes integral with the base metal.

Vibrating Head—Equipment for spark deposition uses a vibrator of tungsten carbide attached to the machine head. This is one electrode, while the work forms the other.

Carbide surfacing affords many positive advantages. One of the most obvious is on high speed cutting tools. Tool specialists are establishing service centers in many areas to provide this hard surfacing.

One of these, Joe Staples of Mor-Life Tool Co., Detroit, reports excellent results with carbide-surfaced Kellering cutters. He says that reamers, spotfacers, cutoff saws, form roll and slitter dies also respond well to the treatment.

Applies to Many Shapes—Another tool expert, H. A. Hayden of Hayden Twist Drill, Warren, Mich. warns that application technique is important. He's developed special fixtures for surfacing circular, cylindrical and irregular forms.

With these he can hard surface many previously impossible shapes. Some are: outside and inside of drill flutes, punches, and interiors of die cavities.

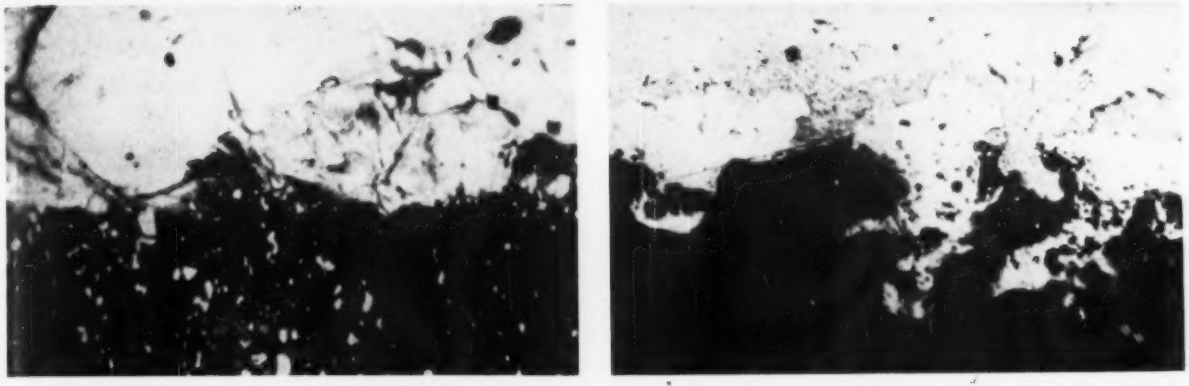
Although in early application stages, this tool treatment is showing phenomenal results in both lab and field tests. A controlled trial under laboratory conditions of a single point HSS tool gave doubled tool life.

Tool Life Jumps—Reports from automotive plants and tool shops show jumps of from 100 to 400 pct in cutter life. On some punches and dies even more spectacular improvements are claimed.

Hayden points out, however, that the surface treatment doesn't convert high-speed steel tools into carbide tools. "It does not increase speeds at which tools can be run, raise load carrying capacity, or better their heat resistance to any degree."

But he adds, "It does increase resistance to breakdown due to abrasion." The method shows little

CARBIDE TRANSFER: High-cycle spark deposits tungsten carbide from vibrator electrode to HSS broach held on table by magnetic chuck.



MICROSECTIONS: Tungsten carbide blends with hardened and tempered high-speed steel (left). In tapered section 10° from normal, tungsten carbide penetrates tool steel surface (right). 700X mag.

improvement on cobalt bearing tool steels, as opposed to most other tool steels.

Where Applied — Most of the tool steels, oil and air hardening, and carbon types, can be hard surfaced. Although basic properties of these materials are unchanged, the abrasion resistance of tungsten carbide is added to critical areas. Improvement in wear is due to the fact that chips slide instead of galling.

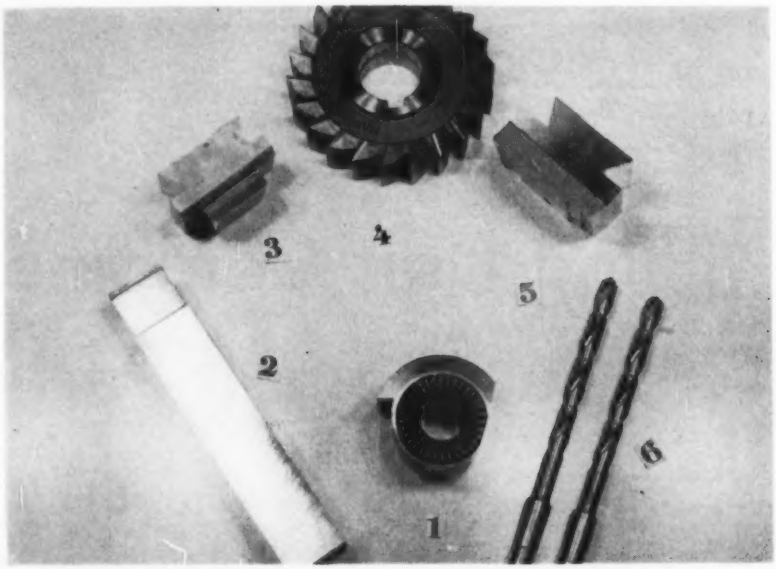
New or resharpened cutting tools are surfaced in area of greatest wear, usually the top rake. By hardening this area against abrasive action, the surface is protected from galling and cratering.

Press tooling is coated at points of metal flow. Almost any shape surface that can be produced by modern machine tools can be surfaced.

What It Does—The surfacing is not a continuous coating, but a series of tiny balls and shallow craters lined and filled with tungsten carbide. The satiny finish is typical of that produced by spark machining.

Surface is non-directional and will not vary more than 0.0001 in. Maximum increase in dimension is about 0.001 in. Best results are obtained with a 0.0004-in. deposit.

This surface will not peel or chip because it's comprised of a multitude of tiny deposits. They individually follow flexing of the tool under load or expansion from heat.



WORKS ON MANY TYPES: 1. circular form tool; 2. segmental form tool; 3. and 5. dovetail tool; 4. milling cutter; and 6. special drills.

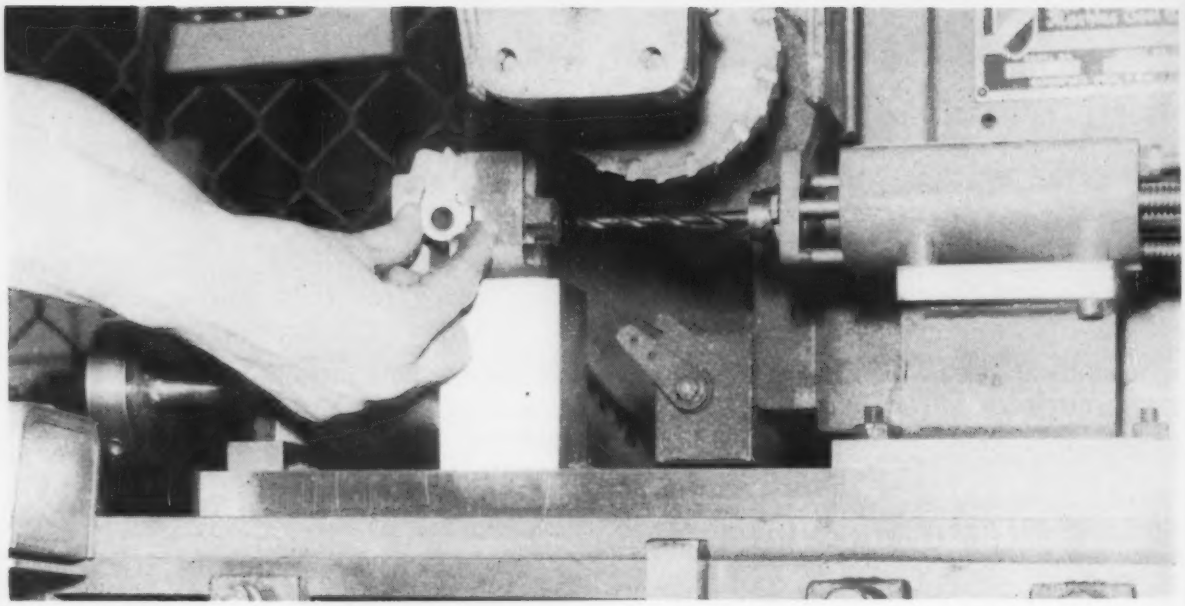
Surface Changes — Photomicrographs reveal that in addition to the millions of deposits of carbide, the process also gives a heat-treat hardening effect. This penetrates into the subsurface of the metal.

When tool steel is treated there is a sandwich effect. Surface and subsurface are hardened. But there is a soft zone between these and parent metal.

When positioned, one electrode is placed almost in contact with the tool and vibrator. As current is applied, spark discharges jump the small gap between electrode and work. Condensers and a dc-current source form setup for spark discharge.

To coat the desired area, the operator moves the tungsten carbide electrode across it in any direction. Repeated treatment of the same area merely raises the density of deposits rather than building up its thickness.

Easco Products, Ann Arbor, Mich., distributes the electro-discharge unit. Called the Sparcard carbide deposition machine, it's manufactured by Impregnated Diamond Products, Ltd., Gloucester, England.



TWO-IN-ONE: Milling cutter and drill go to work at the same time to process slot and hole in one step.

Milling Unit Combines Steps To Speed Small Parts Output

A handy aid to finishing complex powdered metal parts is a milling unit that adapts to a variety of operations.

This one combines milling and drilling in one setup.

▪ Small milling machines add flexibility to production of powdered metal structural parts. They cut many slots and drill holes that cannot be made easily in powdered metal presses.

That's what Ferro Powdered Metals, Salem, Ind., finds in making a multitude of odd shaped parts. To provide such facilities, Ferro uses No. 1 U. S. Milling Machines, built by the United States Machine Tool Co., Cincinnati.

According to J. F. Helsel, president of Ferro, these small mills are ideal for this type of work. They are simple and inexpensive, yet permit rapid setup changes and are highly productive.

Let Miller Do It—A typical example is the processing of governor thrust forks. Precision pressing combined with an economical slotting and drilling operation gets substantial savings in cost.

By using the No. 1 U. S. Mill, Ferro not only mills the slot efficiently, but also drills a No. 3 hole. It's done simultaneously by mounting a multi-angle drill unit on the miller.

A specially-shaped fixture locates the part accurately. After the operator locks the part in place, he pushes the start button.

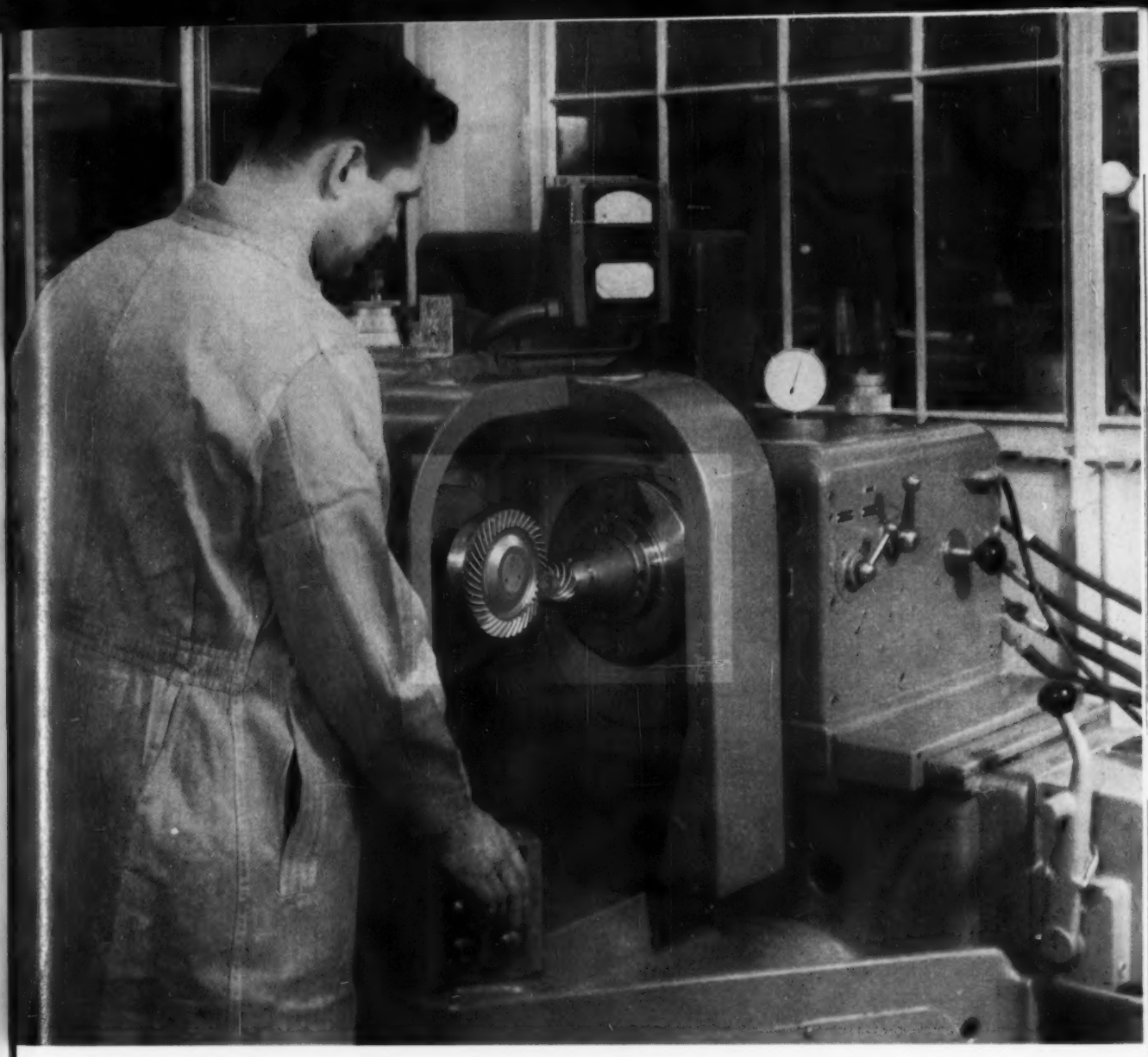
The unit's air-hydraulic table feeds, then returns with milling and drilling taking place at the same time. As each fork is finished, a new part is put in its place and the cycle is repeated.

Use Extra Space—Operating at a spindle speed of 410 rpm, the slothead mounts on the miller's overarm. There's still ample room to incorporate the drilling setup or whatever other functions may be needed.

Not only does the setup eliminate a costly handling step, but it saves time by performing both operations at the same time. The production rate is 160 parts per hour.

Simple construction of the milling unit allows a variety of functions to be set up for molded and sintered metal powder parts. The low-cost setup is available for keyways, sawing, slotting, squaring, cut-off, short-run splining and light slab milling.

Heavy construction and few moving parts keeps maintenance costs down. Six speed changes may be made by changing the V-belt position.



Now you can *speed-test* gears up to 4000 RPM

Since the accuracy of any gear test depends on how well it simulates actual operating conditions, we've developed a hypoid tester with speeds up to 4000 RPM. The higher range of speed on the No. 17A-4000 Hypoid Tester makes possible a new standard in the testing of bevel gears.

Complete testing on one machine. The No. 17A-4000 Hypoid Tester is arranged for both power and slow rolling tests. With the power test you can observe a gear's smoothness of operation, its noise characteristics, and its tooth contact pattern.

Roll test the gear and you get accurate readings of its eccentricity, tooth size, spacing, and profile.

With the No. 17A-4000 Tester you can test any right angle straight bevel, Zerol® bevel, spiral bevel and hypoid gear of any pitch and up to 20″ OD.

Pre-set backlash control. The No. 17A-4000 Tester has a new hydraulic backlash control mechanism. The control automatically duplicates your pre-set backlash value when you change the relative positions of a gear pair to simulate actual operation.

Exact duplication of settings. Indicator set-up fixtures are available for large quantity testing. With these gages you can make identical settings on a battery of machines, or get the same setting repeatedly on a single machine.

New bulletin. We've prepared a bulletin on the No. 17A-4000 Hypoid Tester to answer any questions you might have about its construction or operation. Write for a copy.

GLEASON WORKS

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79

HIGHER BONDING STRENGTH

WITH KAISER BASIC BRICK FOR THE STEEL INDUSTRY

Exceptionally high strength at critical intermediate temperatures (1400°F to 1850°F) . . . that's the unique advantage you get with Kaiser unburned brick!

When the internal temperature of bricks in a furnace structure reaches the point where the chemical bond is destroyed, brick strength reaches its lowest point and cracking and spalling losses may result. In the chart, note the high crushing strength after firing in the intermediate range. This denotes strong bond at all temperatures — a unique feature of Kaiser unburned bricks.

The Difference: Solid State Reaction

With Kaiser brick, there is no "liquid phase" in the formation of the ceramic bond. Kaiser's use of volatized silica (particles as fine as cigarette smoke) promotes a **solid state reaction** at lower temperatures which starts to form the ceramic bond **before** the chemical bond burns out. Result: **higher** bonding strength, **higher** resistance to thermal shock and mechanical abuse in furnace charging.

Solid state reaction also gives Kaiser brick outstanding resistance to distortion and shrinkage. Excellent resistance to chemical attack by furnace fumes, iron oxides and slags is assured by high MgO content, maximum brick density and chemically stable composition.

Make your own comparison tests and see how much more performance you get with Kaiser Basic Brick. And ask to see the new 30-minute color movie "Progress In Modern Basic Refractories." Your Kaiser Chemicals Sales Engineer or Regional Office will be glad to make the arrangements.

Call or write Kaiser Chemicals Division, Dept. S913Z, Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

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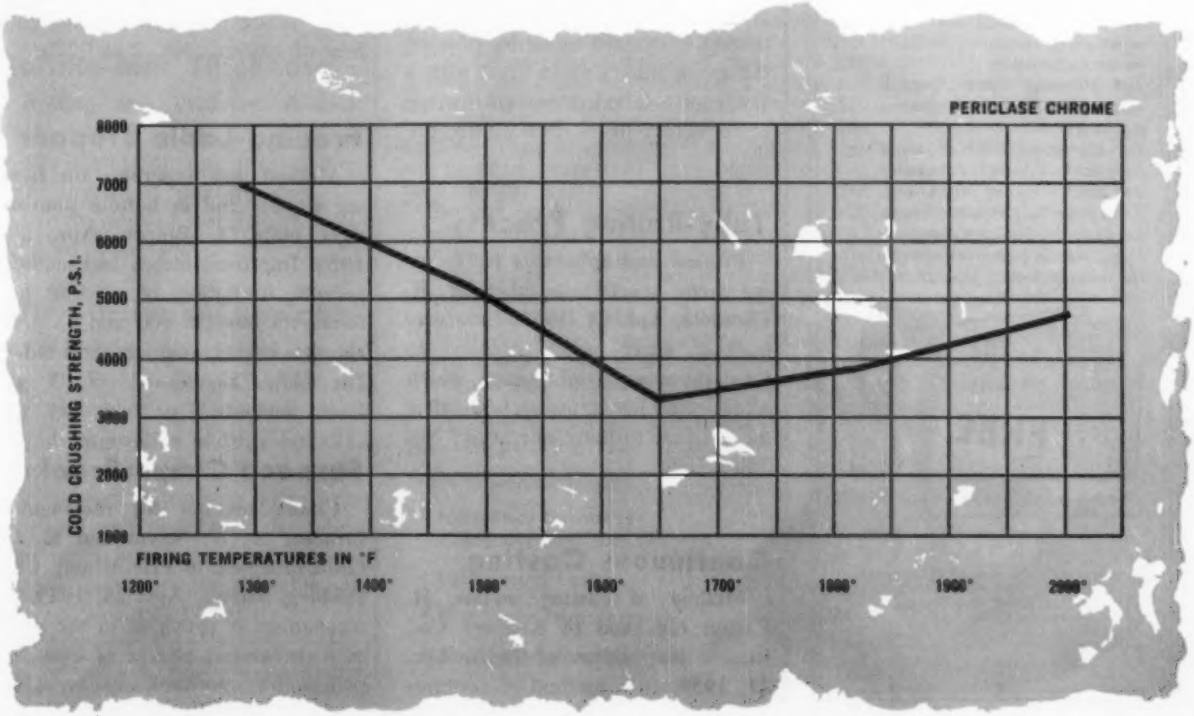

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Complete financing for Lease-Purchase of a new plant is available in labor-surplus areas of Pennsylvania through combined efforts of lending institutions, non-profit community organizations and the Pennsylvania Industrial Development Authority. Interest as low as 2%, with deferred amortization, can be applied on up to one-half of total plant cost.

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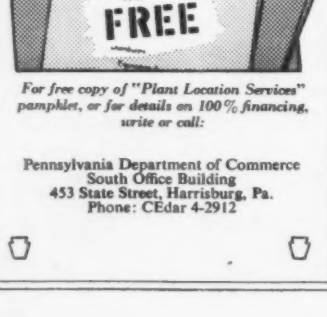
Total financing, secured through local subscriptions and mortgage loans, without cash investment by the manufacturer.	*100%*



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PATENT REVIEW

New Patents In Metalworking

Combination Ladle

Back weighing and pouring of molten metal into foundry molds, T. A. Deakins, J. A. Lasater, and S. C. Northington, Jr., (assigned to Combustion Engineering, Inc., New York, N. Y.), Apr. 21, 1959. A new method combines the weighing and pouring functions into a single ladle used to dispense molten metal into molds. No. 2,882,567.

Ingot Mold Linings

Lining for ingot molds, E. F. Leaberry, H. F. Hendershot, and P. H. Edwards (assigned to The International Nickel Co., Inc., New York, N. Y.), Apr. 21, 1959. Improved castings of chromium-containing alloys are made by pouring the metal into a mold lined with a sleeve of a felted or woven matting of refractory fibers. No. 2,882,568.

Tube-Rolling Process

Process and apparatus for forming metal sheets into tubes, H. B. Chatfield, Apr. 21, 1959. By a new method, sheet metal is rolled to form tubes with tight seams which retain circular cross-section after the original forming operation. No. 2,882,767.

Continuous Casting

Method of casting metals, R. Easton (assigned to Koppers Co., Inc., a corporation of Del.), Apr. 21, 1959. In a method of continuously casting rimmed steel, the molten steel is poured from a supply zone to an open-ended mold zone, and is continuously supplied during the pour with a deoxidizing agent, e.g., aluminum wire. No. 2,882,571.

Refining Metal Baths

Method and arrangement for refining metal baths in rotary furnaces, R. F. Graef and L. A. von Bogdandy (assigned to Huttenwerk Oberhausen A. G., Oberhausen, Germany), Apr. 21, 1959. In refining metal baths by oxygen injection, a method is provided for partially or completely burning to CO_2 the CO formed during the reactions. Waste gases are substantially free of oxygen. No. 2,883,279.

Freeing Ladle Stopper

Method and apparatus for freeing stopper rod in bottom pouring steel ladle, J. Bidner, Apr. 28, 1959. Improved means and method prevent formation of a skull between the stopper rod and its nozzle in a bottom pouring steel ladle. No. 2,883,722.

Furnace Chunk Breaker

Chunk breaker for rectangular furnace, A. W. Storm and K. C. Groll (assigned to Erie Mining Co., Hibbing, Minn.), Apr. 28, 1959. A mechanism is provided in the path of a descending charge of iron ore pellets for mechanically breaking

of any chunks, or agglomerates of pellets, which may have been formed in the column by the heat. No. 2,884,237.

Agglomerating Fine Ore

Method of agglomerating fine ore, T. A. Johnson (assigned to U. S. Steel Corp., a corporation of N. J.), Apr. 28, 1959. In the agglomerating of taconite or the like, an alkali-metal-free, colloidal silica suspension, such as du Pont's "Ludox," is mixed with the ore, and the mixture balled or pelleted and heated, or laid on a grate and fired. No. 2,884,320.

Iron Desulphurization

Method for treating molten metal, A. J. Macdonald (assigned to National Steel Corp., a corporation of Del.), Apr. 28, 1959. By an apparatus and method for desulphurization of molten iron, the soda ash-pig iron ratio is readily varied to compensate for variation in the sulphur content of the pig. A high order of desulphurization is obtained, even when employing low grades of Na_2CO_3. No. 2,884,321.

"Patent Review" appears in the third issue of The IRON AGE each month. Look for it in the June 18 issue.

Rolling-Mill Thickness

Rolling mill thickness control, C. A. Vossberg, Apr. 28, 1959. A new method for operating rolling mills insures a uniform gage for the rolled web of metal strip product. No. 2,883,895.

Wire-DrawingLubricant

Lubricating guide for wire drawing, C. W. Smollinger and R. F. Joy (assigned to Bethlehem Steel Co., a corporation of Pa.), Apr. 21, 1959. An attachment for a dry lubricant box thoroughly mixes the lubricant and distributes the lubricant more heavily and evenly over the rod or wire without packing in the die. No. 2,883,039.

Copies of U. S. Patents are available at a cost of 25¢ each from Commissioner of Patents, Washington 25, D. C.

Built by HEVI-DUTY specialists in industrial furnaces

Hevi-Duty furnace earns $1,000 per month for Bedford Gear

The installation of a Hevi-Duty Clean-Line, automatic, heat treat unit has *eliminated $1,000 per month in scrap losses* for Bedford Gear and Machine Products Company, Bedford, Ohio.

In addition to the elimination of rejects, savings in time, handling and outside heat treating costs have been realized.

The Clean-Line installation includes a Carbonitrider, Washer, Atmosphere Draw Furnace and a 1000 CFH Endothermic Generator. All loading tables are the same height, enabling Bedford to transfer loaded baskets from one unit to another on a dolly, with no lifting or straining. Once loaded, the individual parts are not handled again until they come out of the draw, completely heat treated.

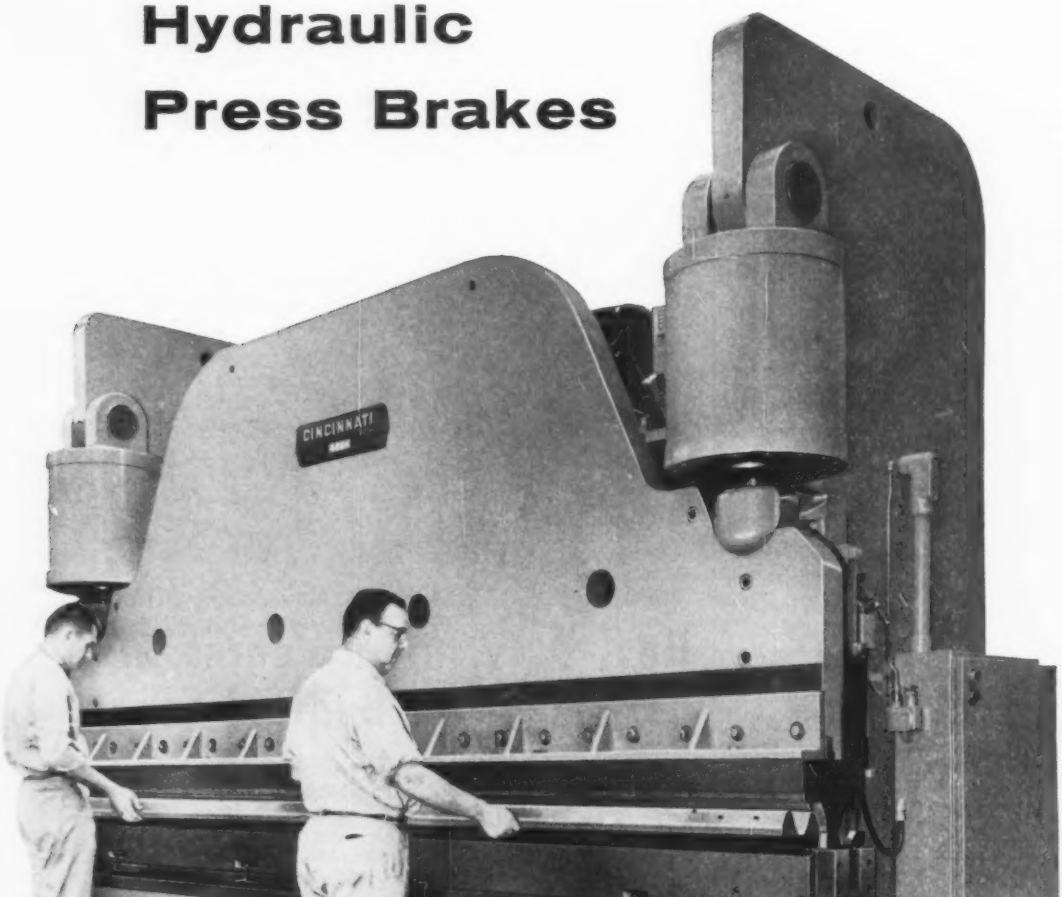
Carburizing is usually done at 1700° F. with case depths of .030 in. obtained in three hours at heat. Carbonitriding is run at 1550° F. to 1625° F., depending upon case depths desired, core hardness and bore size to be held. Automatic control of the quench oil temperature between 150° F. and 250° F. also helps control size which, in many instances, is held to within .001 in.

Bedford's savings over previous operations and elimination of rejects will pay for the new equipment in a matter of months. Modern equipment can improve your costs and quality. Let us send you a detailed bulletin on Hevi-Duty Clean-Line equipment — and arrange for an engineer to call and show you ways to reduce costs, improve quality. Write for Bulletin D-100.

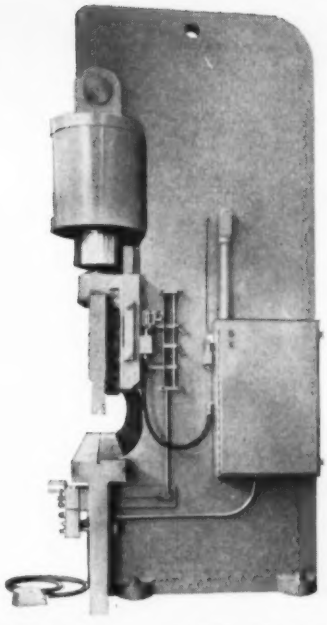
- Industrial Furnaces electric and fuel
- Laboratory Furnaces
- Dry Type Transformers
- Constant Current Regulators

HEVI-DUTY ELECTRIC CO.
Milwaukee 1, Wisconsin

3 basic advantages of CINCINNATI® Hydraulic Press Brakes

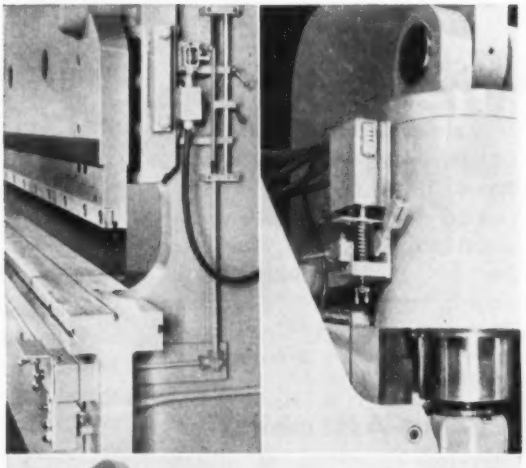


Cincinnati® Hydraulic Press Brakes, now available in 300, 400, 500, and 600 ton capacities, are not substitutes for Cincinnati® Mechanical Press Brakes. Where high production, maximum accuracy, and greatly increased tonnage at the bottom of the stroke are required, Cincinnati Mechanical Press Brakes remain unchallenged. However, where accuracy requirements are not extremely critical, where high speed is not necessary and where long strokes are desirable, Cincinnati Hydraulic Press Brakes offer important advantages—some entirely new to the field of hydraulic press brakes.



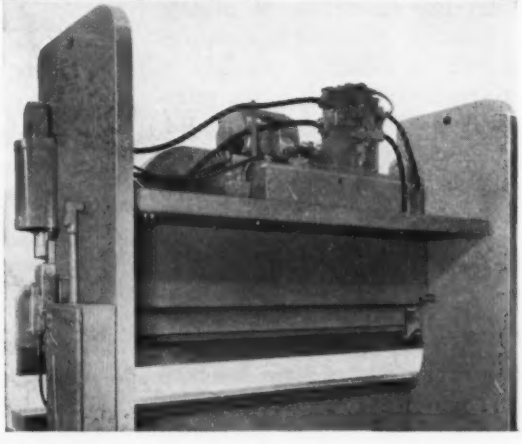
1 Accuracy

A special Cincinnati feature is extra heavy housings which extend above the cylinders, providing a means for their unique clevis mounting. This gives true center-line loading: vertical thrust of the cylinders is carried by the housings *without welds or bolts.* The cylinders are connected to the ram with ball joints and are self-aligning in all directions. Binding of pistons and ram slides cannot occur. In addition, deep beds and rams, and large radii at all stress points minimize deflection and insure maximum accuracy. With Cincinnati interlocked construction, the bed is supported directly by the housings *without* load bearing welds.



2 Convenience

All controls are at right end of the machine, within easy reach of the operator. The bottom stroke-stop adjusting crank is on the front of the bed. Micrometer registers are provided to indicate both the bottom stroke-stop and ram tilt adjustments, a great convenience in setting dies on initial or repeat setups. Tonnage, stroke length, and ram position are easily set. Indicator lights tell direction ram is moving or ready to move. Machine cannot overload: it reverses when loaded to any given tonnage setting.



3 Economy

Greatly simplified maintenance and reduced cost result from Cincinnati's exclusive hydraulic manifold block, which brings valves and piping together in one compact assembly. The usual maze of valves, pipes and fittings is eliminated. High pressure joints are reduced to a minimum, which means important maintenance economies, year after year.

Write Dept. B for informative Bulletin HB-1.

Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO. Cincinnati 11, Ohio, U.S.A.

New Catalogues And Bulletins

Money-saving products and services are described in the literature briefed here. For your copy just circle the number on the free postcard, p. 167.

Punched-Card System

A punched-card system installed by one manufacturer has improved accounting methods and customer service. The story is told in a new booklet, which explains how the system increases efficiency and saves time and money throughout the company's operation. (Remington Rand, Div. of Sperry Rand Corp.)

For free copy circle No. 1 on postcard, p. 167

Loading Assemblies

Loading assemblies are used in industry wherever large quantities of fluid are loaded or unloaded. A two-page bulletin discusses selection of the loading assembly needed. Also, loading valves are described, with emphasis on the patented shock-reduction features of this company's line. (Jordan Corp.)

For free copy circle No. 2 on postcard, p. 167

Low-Cost, Safe Presses

A unique control design has been built into a line of presses to provide safe, uninterrupted production of stampings. High-torque drive with low-inertia flywheel and no clutch provide quiet, smooth operation when single-stroking, and permit interlocking of overload devices into the control system to entirely eliminate die damage. Double-tripping is impossible. A positive, instant-acting stop button is incorporated. These presses come in seven capacities, from 5 to 26 tons. (Kenco Mfg. Co.)

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Vapor Brazing Flux

An engineering data sheet describes a vapor flux which improves poor dry-hydrogen atmospheres to obtain good wetting and flow of brazing alloys for high-temperature service. Brazing alloy flow at lowest possible temperatures is promoted. Difficult-to-braze materials (titanium and aluminum alloys) can be brazed between 1800° and 1950°F. Instructions for use are included. (Wall Colmonoy Corp.)

For free copy circle No. 4 on postcard, p. 167

Product Brochure

A brochure, "America Lives Better," very briefly suggests some of the home and industrial uses of a line of hardware, tools, materials, and accessories. (The Stanley Works.)

For free copy circle No. 5 on postcard, p. 167

Carbon-Steel "Specs"

A two-page data chart is available by which Government carbon steel specifications can be easily identified. Chemical analysis requirements, specified forms, and nearest corresponding SAE, AISI, and AMS type numbers are also listed. (Peter A. Frasse & Co., Inc.)

For free copy circle No. 6 on postcard, p. 167

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MEEHANITE METAL CORPORATION

NEW ROCHELLE
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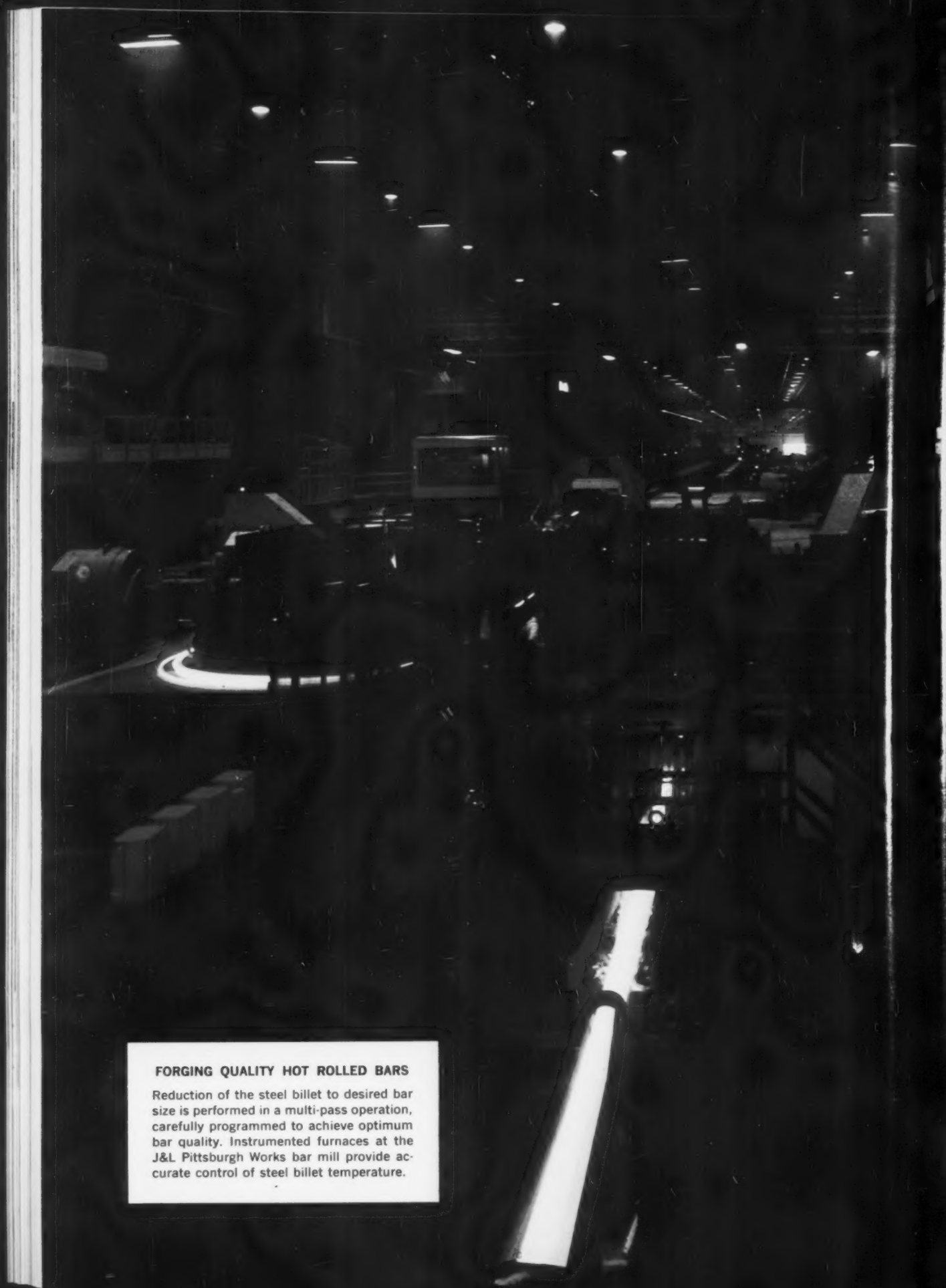
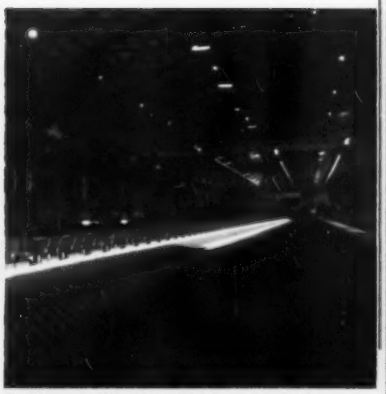


FORGING QUALITY HOT ROLLED BARS

Reduction of the steel billet to desired bar size is performed in a multi-pass operation, carefully programmed to achieve optimum bar quality. Instrumented furnaces at the J&L Pittsburgh Works bar mill provide accurate control of steel billet temperature.

Hot flame scarfer removes surface imperfections from the bloom to assure top quality steel billets, basic raw material for the bar mill.

3″ x 3″ steel billets emerge from the billet mill to this cooling bed where they are tested by J&L metallurgists for product uniformity.



Forging quality hot rolled bars leave the bar mill on this runout table. They are inspected for accuracy of section.

Refrigerator cam shaft, forged from a 57/64″ coarse grained C-1117 square, has a perfect balance of properties for long, hard usage.

Automobile transmission part, forged from a 2¼″ round, has exact balance of properties that helps reduce production cost. AISI Grade 4027.

Automobile steering knuckle support is forged from 1-15/16″ J&L round. AISI Grade 1340.

J&L Forging Quality Hot Rolled Bars are carefully detailed for precise balance of chemistry and physical properties to meet your special requirements. As an integrated producer, J&L combines control of raw materials with the special facilities and successful production experience that are necessary **to provide exactly the right forging quality steel for any application.** A field staff of J&L metallurgical consultants will work with you to determine the steel which will best serve your particular requirements for forging, machining and end product use. The consultant then works directly with the J&L mill to obtain a forging steel that **is tailor-made for your operation.** Simply call your local J&L district office for a preliminary discussion, or you may write directly to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

BEARING BRIEFINGS

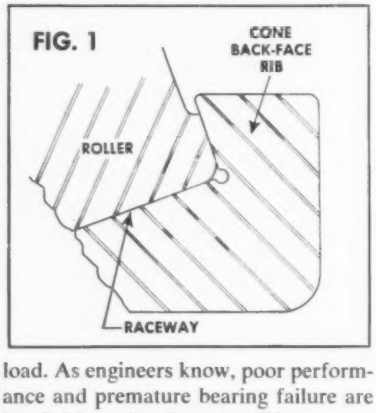
One in a series of tecnnical reports by Bower

BEARING GEOMETRY MAKES OR BREAKS BEARING PERFORMANCE

To develop high capacity and optimum performance in a tapered roller bearing, it is essential that roller alignment be accurate. Correct roller alignment, in turn, depends on a critical geometric relationship between the cone back-face rib, and the cone raceway.

Perfection in this geometric relationship compels the rollers to align themselves perfectly with respect to the bearing geometry, and each roller shares equally in the work that is imposed. Figure 1 diagrams the important elements involved.

When this rib-to-raceway relationship is incorrect (because of either faulty bearing design or manufacturing inaccuracies), rollers experience misalignment and begin to skid and skew under



load. As engineers know, poor performance and premature bearing failure are inevitable under these conditions.

In the design and manufacture of Bower tapered roller bearings, Bower engineers take great care to generate and hold an exact face angle on the cone back-face rib. In practice, this means that Bower

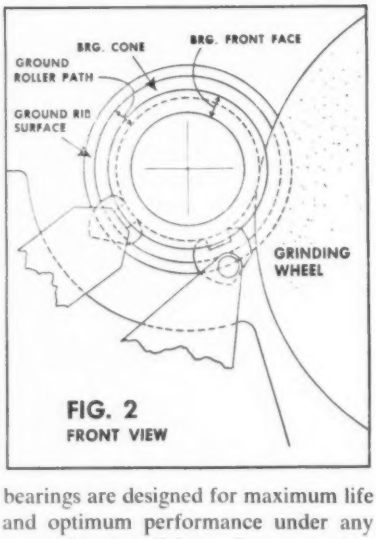
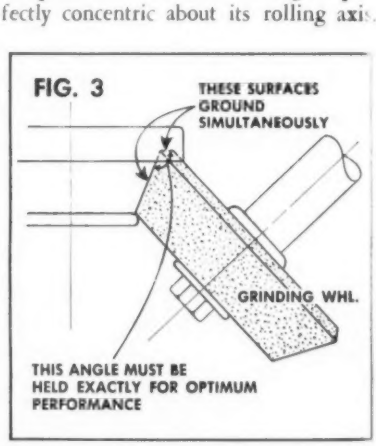


FIG. 2
FRONT VIEW

bearings are designed for maximum life and optimum performance under any operating conditions. It means that Bower bearings retain accurate roller alignment under all speeds and loads up to the maximum for which the bearing is rated.

It's one thing to develop proper bearing design on paper, but quite another to carry it out consistently in manufacture. To this end, Bower engineers were instrumental in the design and development of a unique centerless grinder on which Bower precision grinds each bearing's cone raceway and rib-face simultaneously. The results obtained from these machines invariably meet or surpass Bower's exacting requirements and assure perfect roller alignment.

Figures 2 and 3 are front and top views which illustrate Bower's technique of centerless grinding rib-faces and cone raceways together. As a result, every component in a Bower bearing is perfectly concentric about its rolling axis.



★ ★ ★ ★

When you require bearings, we suggest you consider the advantages of Bower bearings. Where product design calls for tapered or cylindrical roller bearings or journal roller assemblies, Bower can provide them in a full range of types and sizes. Bower engineers are always available, should you desire assistance or advice on bearing applications.

BOWER ROLLER BEARINGS

BOWER ROLLER BEARING DIVISION — FEDERAL-MOGUL-BOWER BEARINGS, INC., DETROIT 14, MICHIGAN

FREE LITERATURE

Continued

These publications describe money-saving equipment and services . . . they are free with no obligation . . . just circle the number and mail the postcard.

Furnace Linings

A new 24-page booklet, "Installing and Maintaining Basic Linings for High Frequency Induction Furnaces," is available. Installation and patching of rammed periclase refractory linings are included. Periclase is an especially manufactured high-magnesia product. (Kaiser Aluminum & Chemical Corp.)

For free copy circle No. 21 on postcard

Circuit-Breaker Control

A compact unit for remote control (open, close, or reset) of molded-case circuit breakers is described in a new bulletin. It is a motor-driven, electrically operated mechanism. (I-T-E Circuit Breaker Co.)

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Surface-Finish Tracers

Profilometers and associated equipment for mechanical or manual tracing of surface finish are described in a 12-page catalog. (Micrometrical Mfg. Co.)

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Super-Pure Chromium

A new 99.997 pct pure chromium, with high ductility, is described in a 4-page bulletin. Use in higher-chrome super-alloys and in development of ductile chrome-base alloys is discussed. (Chromalloy Corp.)

For free copy circle No. 24 on postcard

Abrasive Substances

A catalog lists important characteristics, considerations, and uses of a line of abrasive shot, grit, and cut wire. SAE specifications on these items are listed. Shot peening and impact cleaning are discussed. (The Cleveland Metal Abrasives Co.)

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Surface Grinders

A new catalog describes and illustrates a complete line of precision surface grinders. Complete specifications and features are included. Sizes range from 6 x 18 to 12 x 30 in. for both hand-operated and hydraulic machines. (Landis Tool Co.)

For free copy circle No. 26 on postcard

Air Conditioners

A 16-page composite product bulletin describes a complete line of air-conditioning products for filtering, cooling, heating, cleaning, moving, exhausting, humidifying, and dehumidifying air. (American Air Filter Co., Inc.)

For free copy circle No. 27 on postcard

Power Equipment

Two new catalogs present design, engineering, and performance capabilities of a line of diesel engines and power units. (Allis-Chalmers Mfg. Co.)

For free copy circle No. 28 on postcard

Honing Machine

A revised bulletin is available on applications of a honing machine in production, maintenance, and toolroom work. Working range covers hole diameters from 0.100 through 2.625 in. with stock tooling, and to 4½ in. with tooling built to order. (Sunnen Products Co.)

For free copy circle No. 29 on postcard

Motor Pulley Package

Described in detail in a 10-page booklet is a new clutch-pulley package for direct installation on standard electric motors from 1 to 25 hp. It combines an electric clutch with a ball-bearing sheave to save wear and tear on motors, starters, and belts. It attaches to any standard NEMA motor shaft. Special advantages are listed, and selection instructions are

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FREE LITERATURE

given. (Warner Electric Brake & Clutch Co.)

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Beryllium-Copper Alloy

Full specifications and processing instructions for three different beryllium-copper alloys are presented in a 12-page data-sheet series. (Pennrold Div., The Brush Beryllium Co.)

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Motor Controls

A new catalog describes and illustrates starters, contactors, starter-relay combinations, multipile pump controls, and overload relays. Overload heater tables are included. (B/W Controller Corp.)

For free copy circle No. 32 on postcard

Mercury Switches

Standard line of mercury switches is fully specified. Some snap-action switches are included. (Micro Switch, a Div. of Minneapolis-Honeywell Regulator Co.)

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Aircraft Magnesium

A 26-page brochure describes the advantages of magnesium-alloy castings, sheet, and extrusions in missile and aircraft uses. (The Dow Chemical Co.)

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Optical Fused Quartz

Varying characteristics of six different types of optical fused quartz, including data on grain structure, bubbles, strain, and fluorescence, are contained in a data file. The uses of each type are also listed. (Engelhard Industries, Inc.)

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Linear Comparator

A 4-page bulletin describes a linear comparator for use in measuring spectrographic plates and similar records. Its range is 100 mm, with direct reading to 0.001 mm. Other comparators in the line are illustrated. (Gaertner Scientific Corp.)

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Coil Dehumidifiers

Draw-through and blow-through sprayed-coil dehumidifiers are illustrated and described in a 24-page catalog. This is the first complete catalog offered in the industry dealing with the blow-through design: a complete section is devoted to principles of this design and application recommendations. Three humidification methods are also discussed. (American-Standard, Industrial Div.)

For free copy circle No. 37 on postcard

Rubber Printing Plates

A folder illustrates the advantages of using rubber printing plates to mark products, labels, or packages. (Markem Machine Co.)

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Small Walkie Trucks

The use and application of small electric-powered walkie trucks are described in a 4-page folder. Seven basic types of walkie truck are described, and selection information and recommendations are given. (The Moto-Truc Co.)

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LTC Transformers

Complete information on new "phase-isolated" load tap changing transformers is available in a 20-page booklet. These are three-phase transformers that provide separate and individually controlled voltage regulation for each phase. (Pennsylvania Transformer Div., McGraw-Edison Co.)

For free copy circle No. 40 on postcard

Welding Positioners

A 16-page booklet illustrates and describes nine heavy-duty models of welding positioner, ranging from 3000 to 100,000 lb capacity. New features and accessories are described. (Harnischfeger Corp.)

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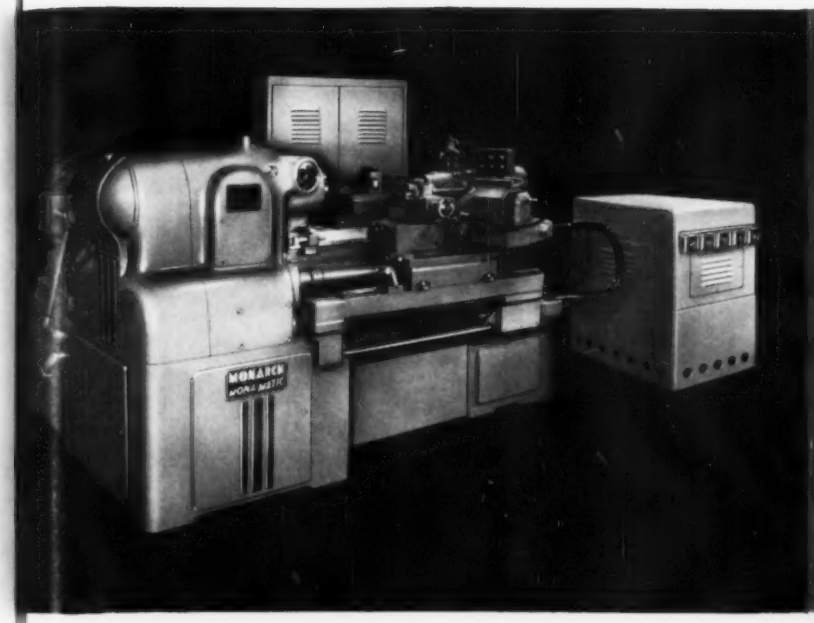
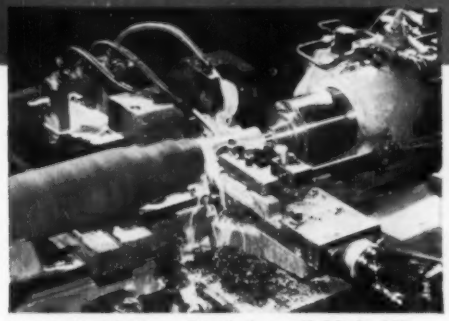
Don't Tool Up for Tomorrow's Boom with Yesterday's Lathes



MONARCH'S HIGH PRODUCTION LATHES OF TOMORROW...



Model 20-H Mona-Matic is available in 18", 30" and 42" center distance. Swing over bed is 15"; over front slide and rear slide ways, 8". Bed ways are flame hardened and ground.

4..The New Model 20-H Mona-Matic—A Low First Cost Production Lathe

Take a good look at what we've done to the Mona-Matic concept of production turning. This new machine

(1) *Carries a low price tag, because of simplified design*

(2) *Has fast hydraulic feed and traverse movements, making it exceedingly productive*

(3) *Is a dependable day after day performer, requiring only routine maintenance for years of trouble-free service*

The Model 20-H is a fully automatic double carriage turning machine, with a 60° "Air-Gage Tracer" controlled front tool slide. A variety of automatic cycling arrangements provides high productiveness and versatility. Eight spindle speeds are available by pick-off gears in each of three standard ranges. The tailstock has an air actuated spindle and inbuilt, heavy duty, anti-friction center.

Front carriage feed rate is infinitely variable from 1" to 40" per minute; traverse is 200" per minute. Rear slide feed rate is ½" to 40" per minute while traverse is at 90" per minute.

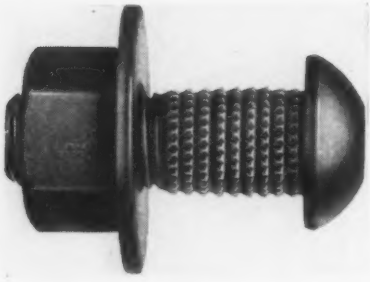
Four different feeds are available to the carriage. Either a one or a two cut cycle can be furnished. Two cut cycle machines are provided with a selector switch for one or two cut operation.

Imagine better performance at lower cost these days! Why not let us set up a demonstration on your parts? *The Monarch Machine Tool Company*, Sidney, Ohio.

Monarch
TURNING MACHINES

IF IT CAN BE TURNED, THERE'S A MONARCH TO DO IT BETTER AND FASTER

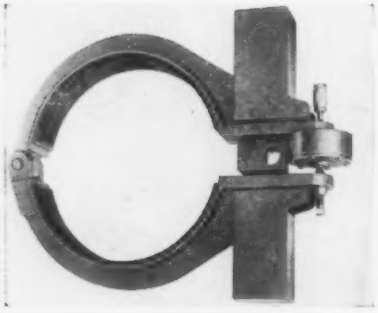
New Materials and Components



High-Strength Structural Bolt Resists Slip

A high-strength structural bolt combines the desirable features of both the Dardelet and high-strength bolt. It combines the tensile strength of a hex-head high-strength bolt with the bearing of a rivet, and has the highest shear strength and greatest resistance to slip of all structural bolts. Its shank is specially knurled, spiraled to reduce driving load. When it is driven or pulled into place, the knurls produce a body-bound fit. No washers are necessary. (Lamson & Sessions Co.)

For more data circle No. 42 on postcard, p. 167



Heavy-Duty Brake Has Maximum Fail-Safe Power

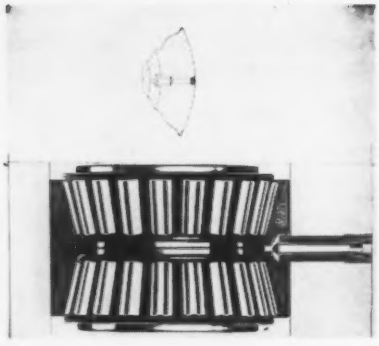
A new self-energizing multiple-spring brake is designed for rugged service on heavy-duty presses. A unique feature is that it offers maximum fail-safe braking power in both rotating directions. Brake torque is effected by a dual spring arrangement, while the release is air-actuated through a large-size cylinder. Welded steel of trunnion-bar design, it has high torque capacity and generous lining area for given diameter. Wear adjustment and field relining are infrequent and simple. (Fawick Airflex Div., Fawick Corp.)

For more data circle No. 43 on postcard, p. 167

Two-Position Controller for Automatic Control

A signaling controller provides accurate automatic control of industrial operations suitable for two-position control action. It can be used with any d-c signal generator, such as thermocouples, tachometer generators, load cells, etc. Corrective action occurs simultaneously with detection of any input deviation. It is sensitive to a change of 1 microvolt. Ranges from 1 to 100 microvolts are available. The controller includes a stable, sensitive, high-gain control amplifier. Red and green signal lights on the instrument indicate process conditions. A built-in safety control shuts off process heat when failure of any system component occurs. Ruggedly built, it takes up only 56 sq in. of panel space. (Thermo Electric Co., Inc.)

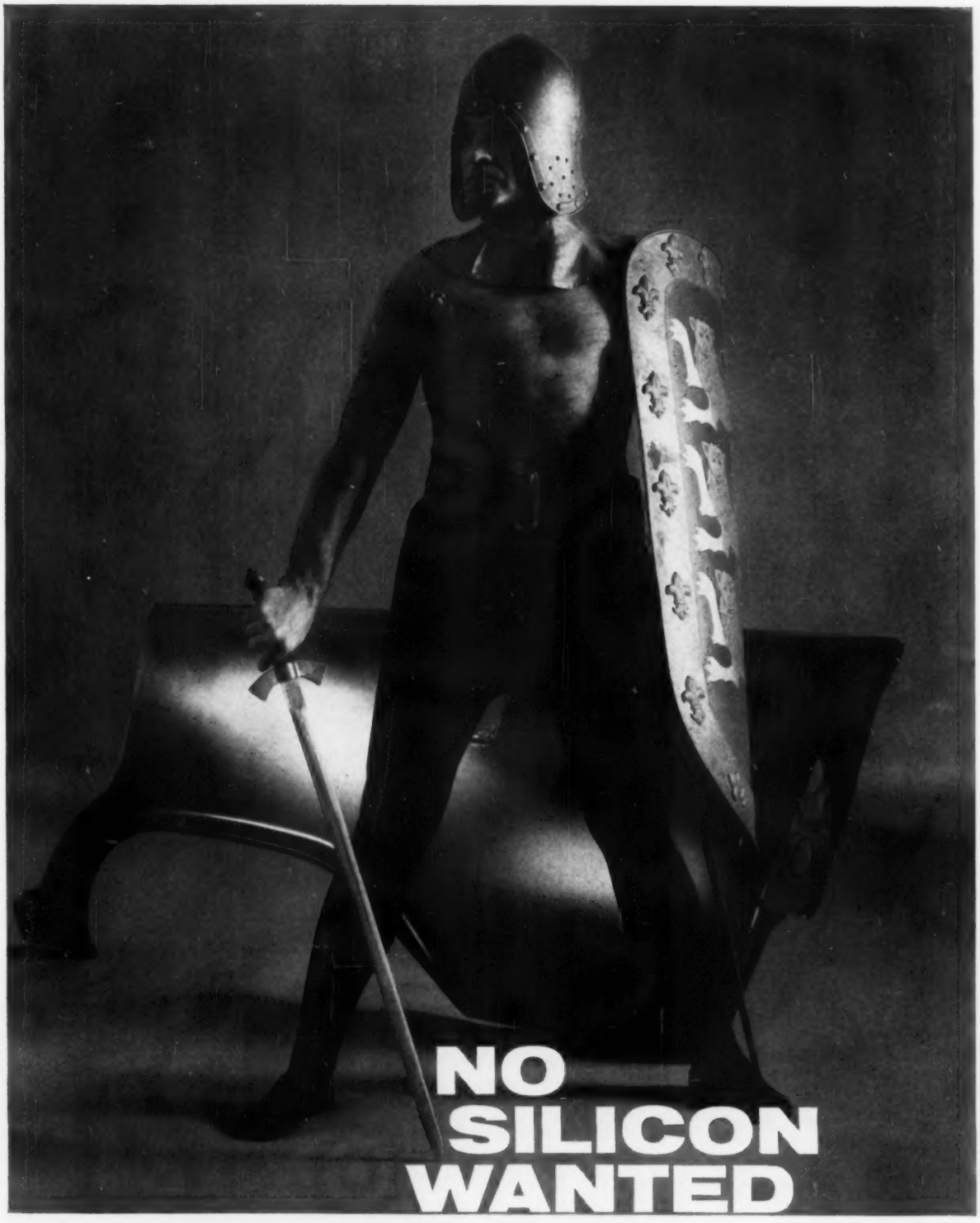
For more data circle No. 44 on postcard, p. 167



"Pin" Type Cup Bearing Offers New Advantages

A "pin" type double-cup bearing has advantages over conventional double-cup bearings in uses where there is a tendency for the outer race to creep or turn in the housing. It was designed primarily for uses where bearings are used with loose cup fits, unclamped in floating positions, where experience has indicated that a cup locking device is desirable. A hollow pin in the housing fits into the countersunk hole in the cup OD. It prevents the cup from turning in the housing, but does not restrict axial float. This design also facilitates positive lubrication through the hollow pin. They are interchangeable with conventional double-cup bearings. (The Timken Roller Bearing Co.)

For more data circle No. 45 on postcard, p. 167



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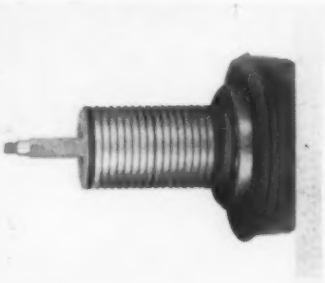
DESIGN DIGEST

Slip-Ring Assemblies

Slip-ring and brush assemblies are available for use in circuits of rotating thermocouples and strain gages. Contacts and rings are of



compatible materials to avoid spurious emf effects. Brushes are individually adjustable. (Rotary Devices Corp.)

For more data circle No. 46 on postcard, p. 167

Machine-Tool Switch

A small heavy-duty limit switch has an advanced low-mass, low-friction design. It measures 1 7/16 x 3⅞ in. Designed to fit many existing layouts, it is rated at 600 v. It is water-, oil, and dust-tight. (The R. B. Denison Mfg. Co.)

For more data circle No. 47 on postcard, p. 167

Rotary Torque Actuator

An improved rotary torque actuator with full cushioning as standard in 0 to 370° of high torque rotation is announced. Powered by air, gas, water, or oil, it seals dead tight and will not back off. It can be stopped at any point with smooth, controlled deceleration. It can be applied to positioning of all kinds. Rotary torque output to 15,000 inch-pounds is possible. Available bore sizes are 4, 5, 6, 8, 10, and 12 in. (Carter Controls, Inc.)

For more data circle No. 48 on postcard, p. 167

Rubber Pipe Silencer

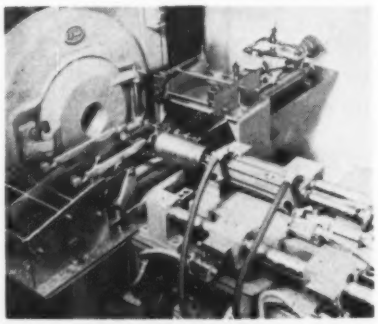
A line of wire-reinforced, flexible rubber pipe to eliminate water-line

noises and absorb "water hammer" is available. These units absorb 90 pct of the noise and vibration coming into water pipelines from attached equipment. Abrasion- and corrosion-resistant, they are ideal in conducting of corrosive chemicals and any abrasive materials, such as sand, chemical ore, or metal chips, in water suspension at pressures to 250 psi and temperatures to 180°F. Two styles for different pressures are available. Special units for oil and acid can be obtained. (Mercer Rubber Co.)

For more data circle No. 49 on postcard, p. 167

Swaging Feeder

A new automatic feeder and unloading accessory provides the nearest thing to automation in swaging. The operator simply places pieces on a feeding rack. Gravity loaded into the feeding mechanism, the piece is automatically gripped and



fed into the swager. After swaging, it is retracted and automatically ejected. Accurate work alignment, positive production control, and greater capacity are assured. (Fenn Mfg. Co.)

For more data circle No. 50 on postcard, p. 167

Casting Resin Binder

A new compounded urea resin powder binder affords a combination of performance characteristics and economies new in the foundry resin field. It has high collapsibility, excellent green strength, lack of stickiness, and fast baking. Storage life is over one year. A built-in color indicator helps determine length of the mixing cycle. Sands coated with it can be blown or rammed. It is for conventional or dielectric-baked cores. (Federal Foundry Supply Div., Archer-Daniels-Midland Co.)

For more data circle No. 51 on postcard, p. 167

Announcing

Complete Electric Furnace Service

by American Bridge, exclusive manufacturers of the Heroult Electric Furnace

1. Complete new installation

From foundation to furnace, from engineering to erecting, American Bridge is prepared to install a modern, efficient Heroult with minimum inconvenience to your operations.

2. Furnace modernization

American Bridge is prepared to modernize your old Heroult Furnace by installing improved new mechanisms that will increase the efficiency and productivity of your unit.

3. Prompt part replacement

If you own a Heroult (regardless of age), American Bridge is prepared to replace any of its parts. More common parts are carried in stock, others will be made to order. But in either case, we are prepared to give fast service.

For more information, contact our office nearest you

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10 years of successful operation with Gulfcut, on varied

GULF MAKES THINGS

From movie camera and slide projector components to garden hose nozzles and worm gears for Venetian blinds —no machining job is too different or too tough for Waterbury Machine Tools & Products Company, Inc. of Waterbury, Connecticut.

And no brand of cutting oil gives them the consistently good results they get with Gulfcut oils.

"We've been using Gulfcut for over 10 years on thousands of really tough machining jobs," says Edward H. Somma, Secretary and General Manager of the firm. "Gulfcut has contributed a great deal to our company's success in this highly competitive field."

Closer tolerances. Finer finishes. Higher cutting speeds. Longer tool life. These are the big advantages Mr. Somma finds with Gulfcut. Plenty of proof that Gulf makes things run better!

A typical machining job at Waterbury Machine Tools & Products is illustrated above. Workpiece was a close-

Smooth finish, using Gulfcut at Waterbury Machine Tools & Products Company. Job: Pivot pin for automotive ignition system. Material: ¼" diameter Naval Brass. Depth of cut: .065". Feed: .006 ipr. Machine speed: 4,260 rpm. Tolerance: .002" on back diameter, .0002" on front diameter. Finish: Excellent.

Edward H. Somma, left, Secretary and General Manager of Waterbury Machine Tools & Products Co., with Peter Eaton, Gulf Sales Engineer. Brown & Sharpe miller at right uses Gulfcut Heavy Duty Soluble Oil, chosen because of its better cooling on the wider surfaces of the milling cutter and for longer tool life.

and tough machining jobs, prove

RUN BETTER!

tolerance pivot pin for contact set used in automotive ignition systems. Material was Naval Brass. Gulfcut helped achieve an extremely fine finish at a production speed of 10⅝ seconds for each piece.

See how Gulf makes things run better in *your* shop. Whatever type of machining you do, there's an oil in the complete Gulfcut line to meet each specific need.

Call a Gulf Sales Engineer at your nearest Gulf office, or mail coupon for pamphlet on Gulfcut cutting oils.

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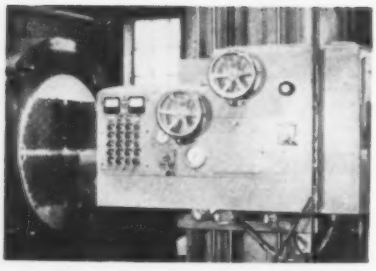
IA-0118

New Equipment and Machinery

New Spiral Tap Flushes Chips, Cuts Smoothly

Long life, great accuracy, and fast chip removal are achieved using a new spiral tap. A 52° spiral provides high shear at the cutting point and uninterrupted chip ejection. This feature, coupled with the 10° to 12° face hook and 2 to 2½ thread chamfer, produces smooth, accurate threads in the most difficult-to-machine materials. Now stringy and high-temperature alloys and ductile steels are tapped to close tolerance with great gains in tool life. The free-cutting action and positive chip flow suit these taps to aluminum and zinc die castings. Priced the same as standard spiral taps, they come in standard sizes, in NC and NF pitches, in machine-screw sizes 3 through 12, and from ¼ through ½ in. in 1/16-in. increments. (The DoALL Co.)

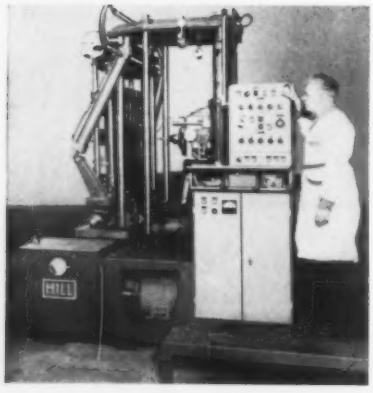
For more data circle No. 52 on postcard, p. 167



Gun-Drill Machine Improves Deep-Hole Accuracy

This gun drill increases deep-hole accuracy, eliminates secondary operations, and permits production shortcuts. Manual controls position the drill to within 0.003 in. The gun drill is supported with outboard bearings. Preset feeds and speeds control it through a cycle that ends with retraction. Runout averages 0.002 in. per ft for a ⅝-in. hole, with finishes of 15 microinches possible. (The Griscom - Russell Co.)

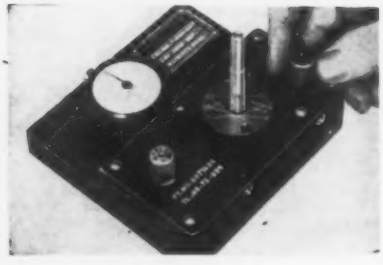
For more data circle No. 53 on postcard, p. 167



Numerically Controlled to Drill, Mill, Jigbore

This low-cost high-speed, single-spindle, numerically controlled precision machine performs a variety of drilling, milling, or jig-boring operations. A rugged hydraulic-powered spindle enables drilling or gun-drilling ¾-in. dia holes in steel at feeds to 30 ipm. Controlled by universal numerical positioning, the machine performs spindle location and operation sequences from punched tape. Three hydraulic systems operate — one for table drive, one for vertical head drive, and one for drill feed and table tilt. Linear spindle positioning is accurate to ± 0.0005 in. Secondary operations such as chamfering, reaming, gun-reaming, and counterboring can be done with the same tape and different tools. (Walter P. Hill, Inc.)

For more data circle No. 54 on postcard, p. 167



Fast, Accurate Gage Device for Splined Shafts

This spline gage combines the function of five gages, replacing the Go-No Go composite rings and master plugs for each, and answers an old demand for a master ring to check the spline gage for the internal spline. The indicator is calibrated with a master setting plug. The device then accurately checks "effective tooth thickness," shortens inspection time, and detects back taper. Accuracy is consistent. (Vinco Corp.)

For more data circle No. 55 on postcard, p. 167

INTRICATE SHAPES, PRECISELY FORMED IN 2 TO 10 MILLISECONDS

By DYNAPAK, a breakthrough in high-energy-rate metal working equipment

Pneumatically energized DYNAPAK, industry's first high-energy-rate machine tool, has produced the shapes pictured here, and many others of equal intricacy. DYNAPAK is equally applicable to extrusion, forging, forming, or compaction. DYNAPAK offers energy outputs from 40,000 to 1,500,000 foot-pounds – tool speeds to 2500 inches per second, controllable to ±12 inches per second. Elapsed time from billet to finished piece, 2 to 10 milliseconds, is so brief as to minimize heat transfer to the die – permits working metal at temperatures to 3500°F – yields longer die life.

DYNAPAK requires no separate pneumatic power source...DYNAPAK is easily installed, horizontally or vertically...DYNAPAK produces smooth surface finishes, radii to .003", webs to .010", fins to .010"; forges to near-zero draft angle. Evaluate DYNAPAK for your metal working problems. Write, wire or phone.

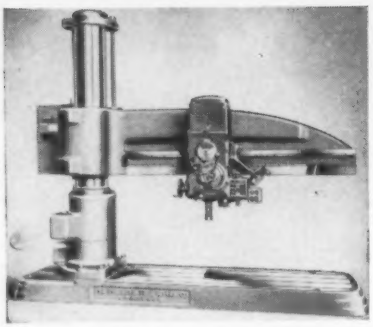
DYNAPAK

CONVAIR, A DIVISION OF GENERAL DYNAMICS CORPORATION

1243 Transit Avenue, Pomona, California · Phone NAtional 9-1109

Medium Radial Drill

Available in column sizes of 13, 15, and 17 in., with arm lengths from 5 to 8 ft, this radial drill is for shops needing a moderate range of drill, boring tool, and tap sizes. Arm reach has been extended to achieve a smaller machine in comparison to arm length. It is thus more easily operated and cheaper. Drilling capacity is 2½ in. in mild steel and 3 in. in cast iron, at 0.014-



in. feed; 1½ in. in steel at 0.025-in. feed. Feeds as low as 0.001 in. are available for finish boring, with accuracy of 0.0003 in. in roundness and taper in cast iron. Its precision-boring - mill - type spindle suits it for use with precision positioning tables. (The American Tool Works Co.)

For more data circle No. 56 on postcard, p. 167

Chip Separator Unit

A compact magnetic separator unit to remove ferrous solids from soluble coolants is automatic and self-cleaning. It contains a tank, magnaplate, baffle, and sludge scraper. It is designed for flow rates from 40 to 1000 gpm. (U. S. Hoffman Machinery Corp.)

For more data circle No. 57 on postcard, p. 167

Optical Pyrometer

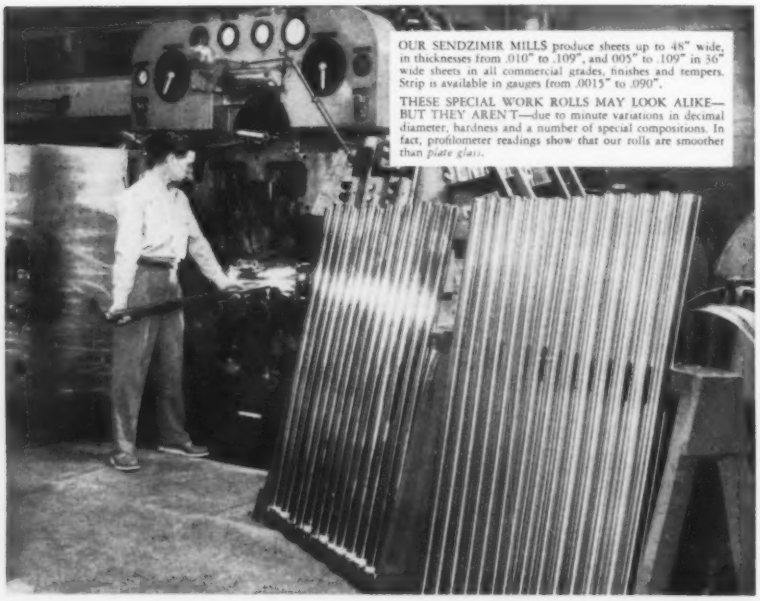
An optical pyrometer for temperature measuring on incandescent or molten iron and steel, or for temperature control of parts in annealing or hardening, combines all mechanical and optical parts in a telescope housing. Reliable and precise, it measures the temper-

ature of the workpiece itself, or the furnace wall, and not the temperature inside the furnace. It contains a floating luminous index mark for easy luminosity comparison. Temperature range from 750° to 5430°F is available. (Epic, Inc.)

For more data circle No. 58 on postcard, p. 167

40-Ton Mobile Crane

Mounted on a self-propelled carrier, this crane can lift and move a 63,000-lb load, and can handle 5000 lb over the rear on 150 ft of


OUR SENDZIMIR MILLS produce sheets up to 48" wide, in thicknesses from .010" to .109", and 005" to .109" in 36" wide sheets in all commercial grades, finishes and tempers. Strip is available in gauges from .0015" to .090".
THESE SPECIAL WORK ROLLS MAY LOOK ALIKE—BUT THEY AREN'T—due to minute variations in decimal diameter, hardness and a number of special compositions. In fact, profilometer readings show that our rolls are smoother than plate glass.

It takes more than just a precision mill to produce* STAINLESS STEEL *of MicroRold® quality

. . . it takes Operating Know-How. Only Washington Steel, first to use Sendzimir sheet rolling, can offer you 10 years of practical experience with these mills.

Every hot-rolled stainless steel band has variations in thickness and surface characteristics which must be compensated for in the cold-reduction process to obtain precise gauge and flawless surfaces. To do this, special work rolls with minute diameter differences along the length of the roll are used in controlling such variations as crown, edge and camber. To accurately control all the possible variations requires a large number of these rolls, plus *highly skilled operators* who know from experience which rolls, speeds and reductions are required. These are but a few of important factors in quality rolling which can only be learned by *long* experience and association with precision mills.

Washington Steel is the only producer whose entire production stainless steel sheet and strip is rolled exclusively on the Sendzimir Mill.

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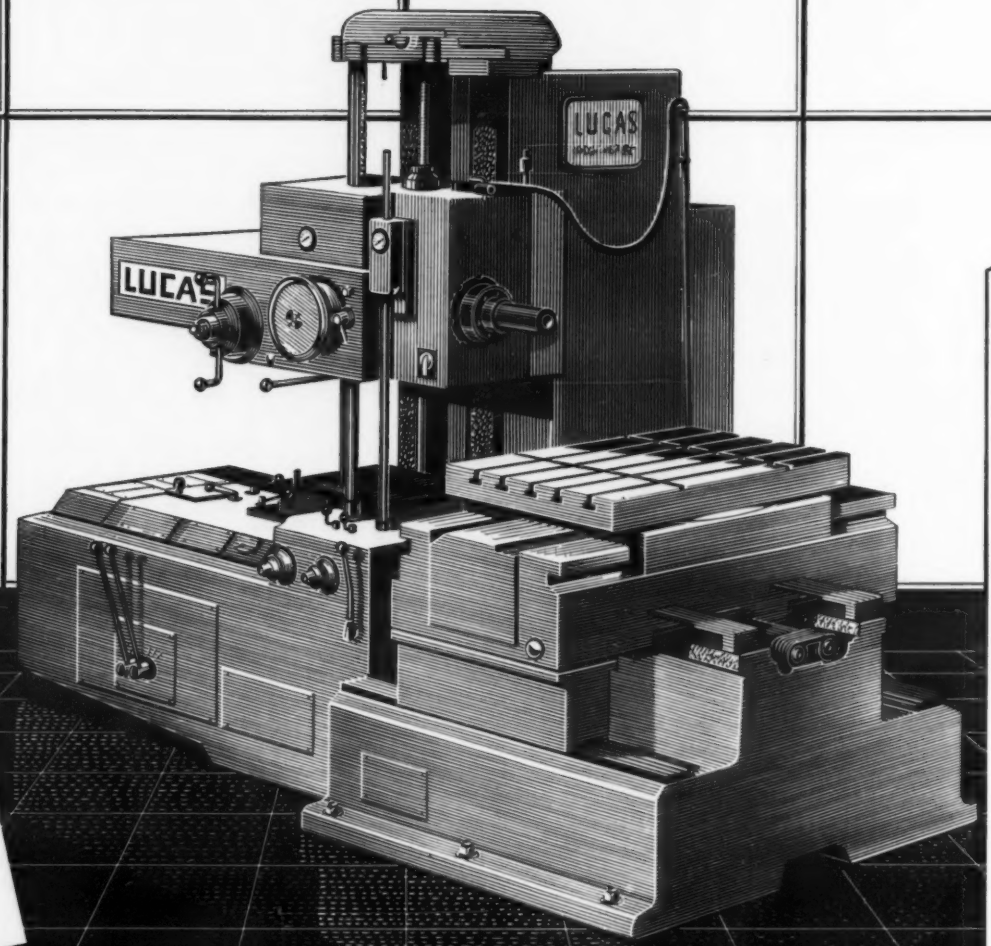
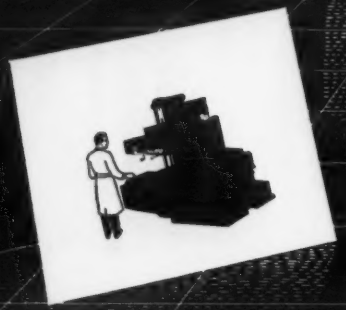
newest and smallest in a distinguished line

LUCAS OF CLEVELAND





The new Lucas Horizontal Boring, Milling and Drilling Machine offers all the quality construction features of the other fine precision machines in the Lucas line plus a built-in Rotary Table. This versatile little machine is made-to-order for production of small dies, fixtures, miniature electronic parts, machine casings, aircraft and missile parts and similar work. The inherent accuracy of the Lucas 275-40-RT suits it for a variety of post-production inspection operations. Air Lift to saddle and table. Constant-operating automatic lubrication. Spindle diameter 2.750″ or 3.000″. Spindle travel 18″. Vertical Head travel 24″. Cross travel 30″. Longitudinal Saddle travel 18″. Table 26″ x 30″. Spindle speeds 62-2000 rpm. Feeds from .0007″-.915″. Tape programming can be added as an optional feature. For complete information, write Lucas Machine Division, The New Britain Machine Company, 12302 Kirby Avenue, Cleveland 8, Ohio.

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In an hour this capable American Rolling Ring Crusher reduces as much as 50 tons — a carload — of metal turnings . . . or 10 to 20 tons of aluminum castings and or stampings.

It's the American-originated rolling shredder rings of manganese steel that make it possible. Soundly engineered throughout, this 60-50 crusher is fully capable of handling large-scale primary reduction. Whatever your requirements there's an American that matches your need . . . from 10 tons per hour up to 50 tons per hour.

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NEW EQUIPMENT

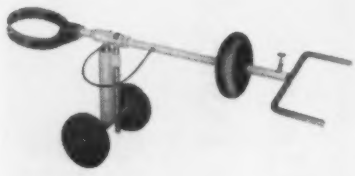
boom at 100-ft radius. Featuring a wide range of controls for complex maneuvering, the machine is convertible and may be used as crane, clamshell, dragline, or pile driver. (Bay City Shovels, Inc.)
For more data circle No. 59 on postcard, p. 167

60-Ton Press Brake

A 60-ton hydraulic press brake is available. Accuracy to within thousandths is maintained by a patented level control system. Operation is by foot pedal. Design is compact, with motors and hydraulic controls housed separately. (Pacific Industrial Mfg. Co.)
For more data circle No. 60 on postcard, p. 167

Tote-and-Pour Truck

A hand truck for conveying and pouring crucibles of molten metal can handle crucible sizes #40 to



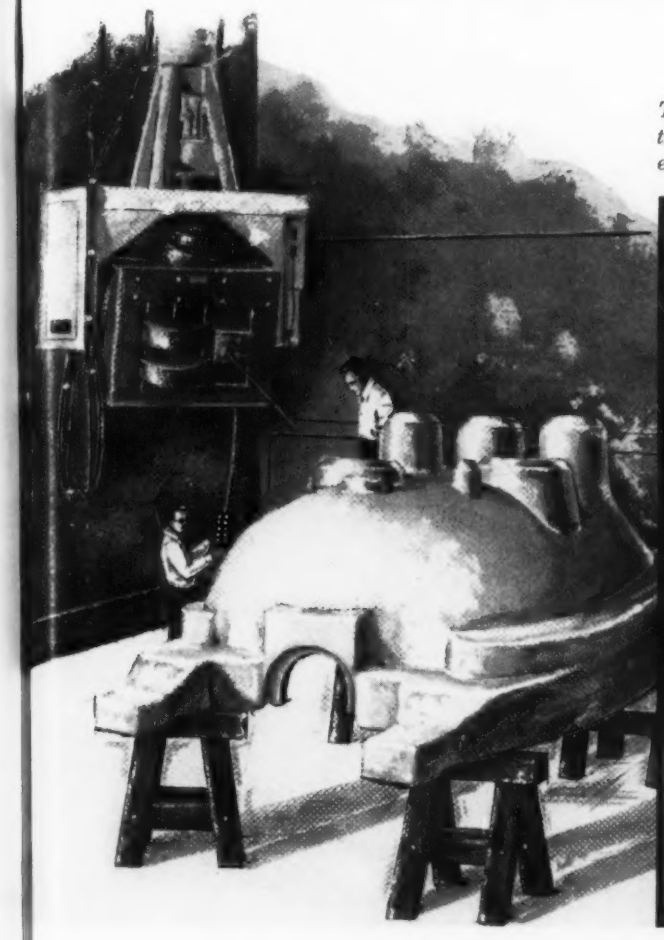
#100. Handled easily by one man, it is raised and lowered pneumatically for varying pouring conditions. (Morehouse Machine Co.)
For more data circle No. 61 on postcard, p. 167

Force Amplifier

An extremely sensitive, yet rugged and flexible, mechanical force amplifier can be actuated directly by mechanical flow-, pressure-, and temperature - measuring elements, and amplify their outputs to position automatic controls, recorders, encoders, or other devices. Input forces less than 1 g can be amplified to forces up to 500 g. It can be powered by an external source, such as a small electric motor. (American Meter Co.)
For more data circle No. 62 on postcard, p. 167

...where industrial progress is cast in steel

NON-DESTRUCTIVE TESTING ...the inside story



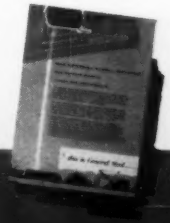
To insure the required quality throughout, the most modern non-destructive testing equipment is used at General Steel.

To meet rigid specifications for high temperature, high pressure and other applications requiring quality components, General Steel uses the most modern non-destructive testing equipment available. Testing for quality is performed by various methods depending on the type of structure.

Among the facilities available at General Steel are magnetic particle inspection units to check for invisible surface defects, and ultrasonic reflectoscope units for sonic testing of internal metal. Radiographic inspection of very heavy structures is done with 24-million volt Betatron units. Conventional X-ray equipment is used for smaller structures. Other methods of non-destructive testing are also available.

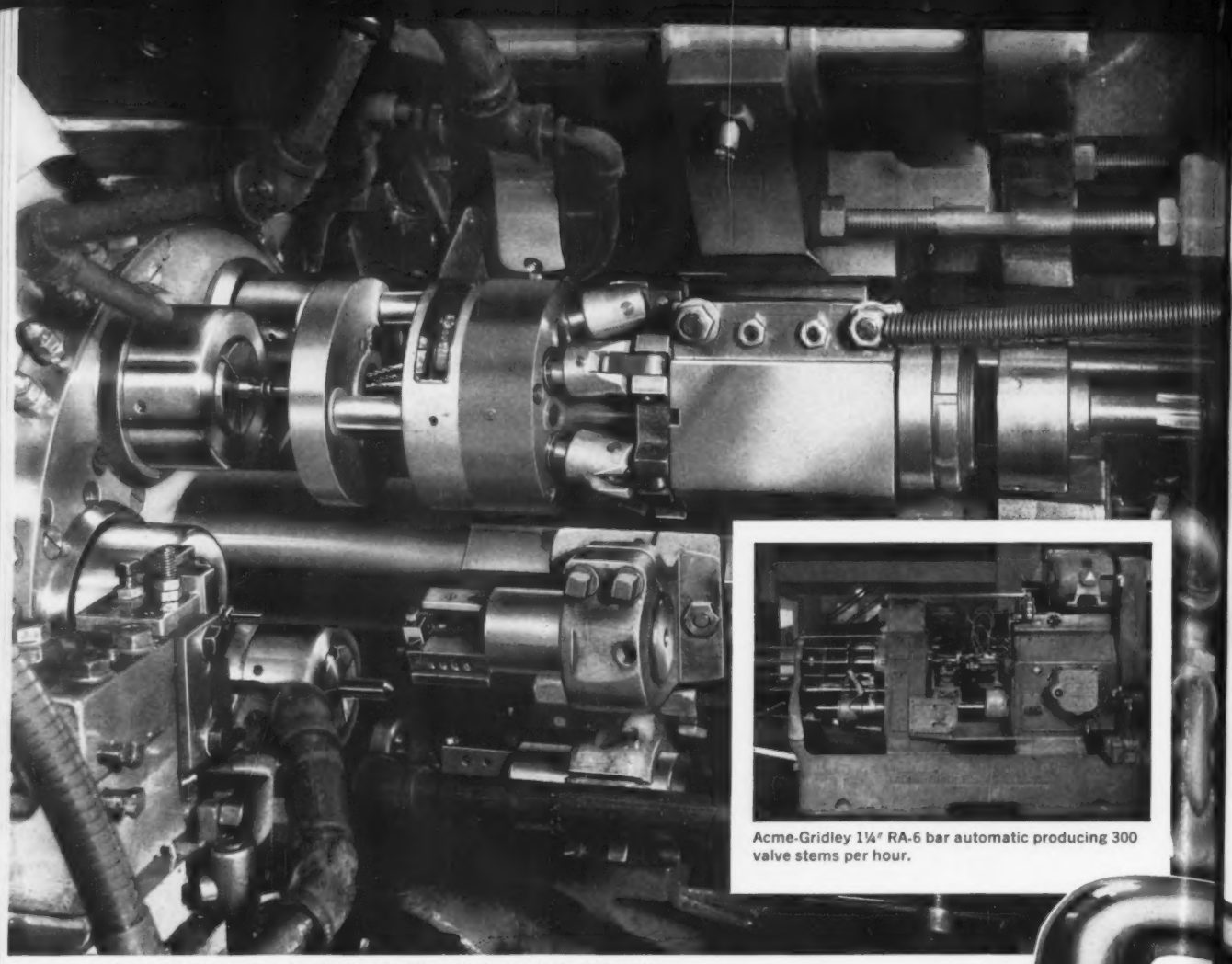
Profit from General Steel's wide experience in the design and production of high quality product components made of cast steel, cast-weld or composite structures. Let our staffs work with you in developing designs for optimum performance.

Write for folder—*How General Steel Castings Can Improve Product Design and Performance.* General Steel Castings, Station 201, Granite City, Illinois



GENERAL STEEL CASTINGS

GRANITE CITY, ILL. · EDDYSTONE, PA. · AVONMORE, PA.



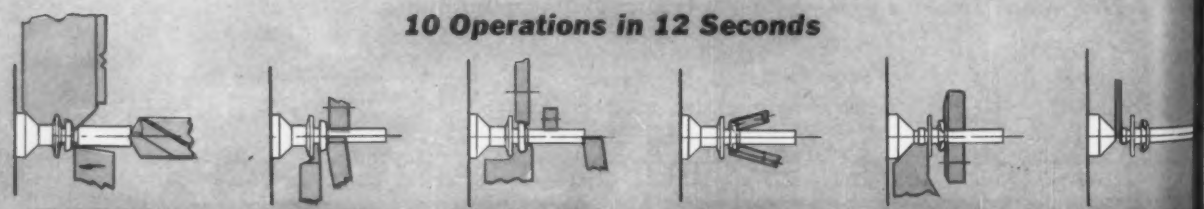
Special Namco-designed multiple end milling attachment in the 3rd position.

Acme-Gridley 1¼" RA-6 bar automatic producing 300 valve stems per hour.

When Tolerances and Finish Looked Economically Impossible

AMERICAN-STANDARD TURNS TO ACME-GRIDLEY...

10 Operations in 12 Seconds



6th position
Rough form rear —rough turn stem —spot drill

1st position
Finish turn stem face large diameter

2nd position
Shave—face and chamfer stem end

3rd position
Stop spindle— mill six slots

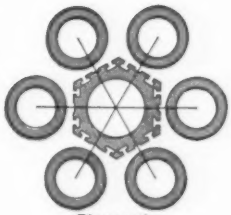
4th position
Start spindle— burnish stem— form back end

5th positio
Cutoff

COMPLETED IN A SINGLE SETUP . . . this hyseal valve stem is a vital component in American-Standard's single-lever mixing faucet. Production by other processes would have meant a two-piece assembly. It would have been economically impossible to meet the high standard of quality and exacting tolerances maintained on this company's products.

Ten operations, including multiple end milling of six half-holes on a 15° angle, were performed on this 303 stainless steel piece in 12 seconds. Rigid specifications required a 20 microinch finish and limits of .002 t.i.r. between seating surface and end of valve stem.

Advanced spindle stopping design and the inherently accurate indexing of Acme-Gridleys, assure proper alignment of the work with the standard and special tool attachments. This, together with wide open tooling zones and independently operated tool slides, helps assure the solution of "impossible" jobs at National Acme. Write or ask one of our representatives for the complete story on the industry's most modern approach to your cost reduction problems.



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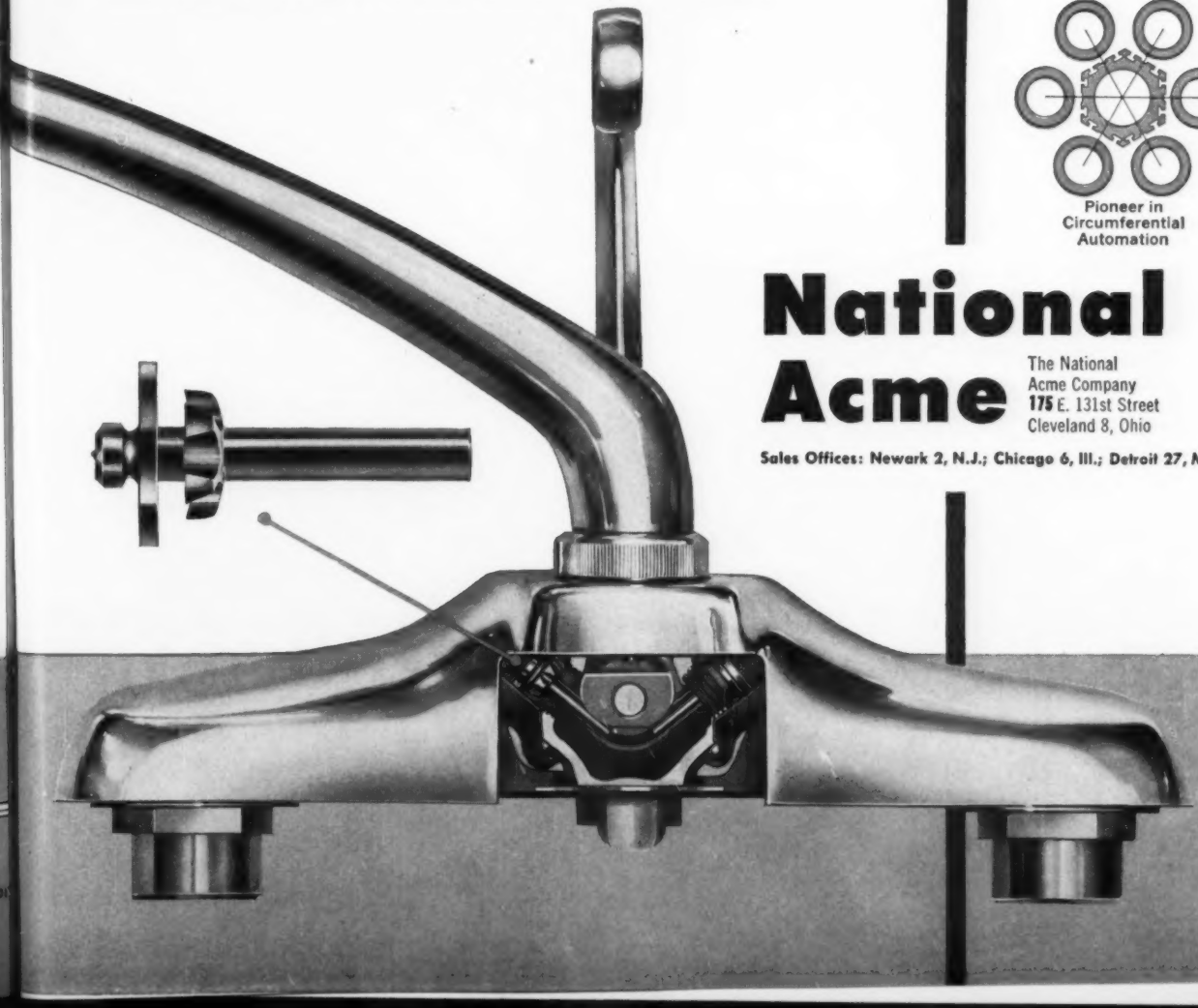
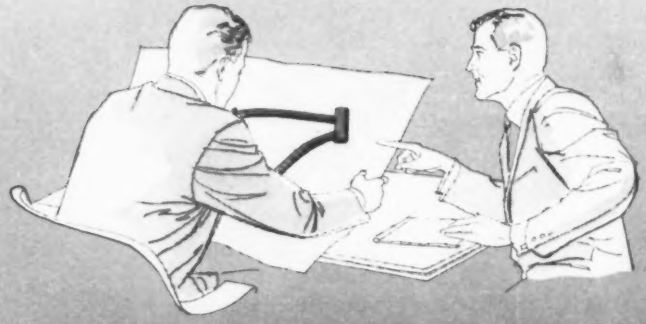
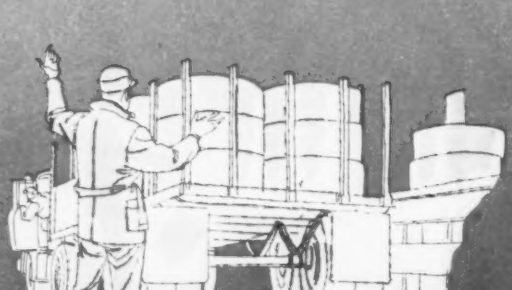


COOPERATION

is a SPECIAL service



at Alan Wood



From the time you first call in your Alan Wood Representative till the cold rolled steel is in your plant, complete cooperation by Alan Wood assures you of the right cold rolled steel for your production requirements. For example, your Alan Wood Representative may suggest a metallurgical study of your situation. He has full information on cold rolled steel and its application, and his advice on type, gauge and size to order can help you eliminate production problems . . . cut costs . . . increase profits.

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The Iron Age Summary

Watch the Steel Operating Rate

If ingot rate drops, it could mean either worker slowdowns or work-in-process cut by the mills.

If operating rate rises, it could mean optimism for settlement plus expectation of continued good demand.

▪ Keep an eye on the steel operating rate. It could taper off gradually during late May and June. Ingot output of one large mill is scheduled to drop six points this week as compared to last.

What Might Happen — This tapering off, if it develops, could be due to two things:

1. Worker slowdowns in the mills.

2. A decision by the mills to cut down on steel in process so as to avoid heavy semi-finished inventory should there be a strike.

Mills Are Worried—In the first case, there seems to be no concerted move by steel workers to deliberately slow down output. But the mills are worried. The dark outlook for steel labor relations is making some workers restive.

On the second point, one steel observer looks at it this way: The mills will start emptying their pipelines after the first week in June. They will stop rolling hot bands, tube rounds and other items whose finishing cycle extends beyond June 30 and a probable strike.

The Significance—If the operating rate drops in June, it could mean that most mills have decided to clean out inventory. This in turn could mean they expect a strike. And it would also mean that the scramble for steel after a strike would be that much worse.

If the operating rate stays up, it will mean that July business is so good that mills cannot afford to let inventories run down. It could also mean optimism for a peaceful settlement of the labor dispute.

A New Upsurge — Meanwhile, steel demand and consumption are such that (1) the mills are steadily falling behind on delivery promises, and (2) inventories of steel users are either dropping or barely holding steady.

At least one mill is warning customers it will need all of July to catch up on delinquencies on bar orders. The same situation is believed to exist in other products.

Getting on the Books—At the same time, a secondary wave of new orders has hit the mills. This business represents steel for delivery in the third quarter—strike or no strike. Steel users figure it's smart to be on the books in view of the unexpectedly high rate of consumption.

Steel management hopes to regain the initiative in its public relations battle with the union when Roger Blough, chairman of U. S. Steel Corp., speaks this week before the National Press Club in Washington. He's expected to reiterate his company's stand against a rise in employment costs.

Steel Output, Operating Rates

Production	This Week	Last Week	Month Ago	Year Ago
(Net tons, 000 omitted)	2,675	2,632	2,646	1,523
Ingot Index				
(1947-1949=100)	166.6	163.8	164.7	94.8
Operating Rates				
Chicago	93.0	93.0	94.0	58.0
Pittsburgh	96 0	96.5*	94.0	52.0
Philadelphia	92.0	94.0	98.0	61.0
Valley	88.0	85.0*	87.0	40.0
West	93.0	93.0	93.0	74.0
Cleveland	99.0	97.0*	94.0	30.0
Detroit	98.0	101.0*	98.0	46.0
Buffalo	107.0	107.0	105.0	46.0
South Ohio River	95.0	92.0*	98.0	61.0
South	96.0	93.0	93.0	67.0
Upper Ohio River	96.0	93.5*	91.5	75.0
St. Louis	98.0	99.0*	99.0	78.0
Aggregate	94.5	93.0	93.5	56.4

*Revised

Prices At a Glance

(Cents per lb unless otherwise noted)	This Week	Week Ago	Month Ago	Year Ago
Composite price				
Finished Steel, base	6.196	6.196	6.196	5.967
Pig Iron (gross ton)	$66.41	$66.41	$66.41	$66.49
Scrap No. 1 hvy (Gross ton)	$34.17	$33.83	$34.83	$34.00
No. 2 bundles	$23.50	$22.83	$23.17	$25.50
Nonferrous				
Aluminum ingot	26.80	26.80	26.80	26.10
Copper, electrolytic	31.50	31.50	31.50	25.00
Lead, St. Louis	11.80	11.80	11.30	11.30
Magnesium	36.00	36.00	36.00	36.00
Nickel, electrolytic	74.00	74.00	74.00	74.00
Tin, Straits, N. Y.	103.50	102.875*	102.00	94.25
Zinc, E. St. Louis	11.00	11.00	11.00	10.00

Electric Control Sales Are Up

April business was about 10 to 50 pct better than last year for most makers.

May is even busier. And the industry figures it's about ready in case of a steel strike.

▪ Electrical controls are bouncing back after slipping 10 to 20 pct last year. There is greater genuine interest being shown in the wares of control makers than in many, many past months.

April was one of the busiest months since this industry went into its slide late in 1957. Sales increases ranged from 10 pct to 50 pct over a year ago. May shapes up even better. But there are no prospects of shortages of "shelf" items developing.

Supply Strength—Inventories at manufacturer and distributor levels are large enough to meet increased demand. Manufacturers and their suppliers say they have made provisions in case of a steel strike.

While there is general agreement that product availability won't be affected by a strike in the steel industry, there is a mixed reaction on what effect a steel price hike might have on price.

Price Hikes?—Selected price increases amounting to about 8 pct went into effect at the end of last month. These were generally applied to standard types of equipment, such as motor controls. The trend for special controls, on the other hand, has been for prices to drop as competition stiffens and experience and technology progresses.

Manufacturers who buy at least part of their components on the outside say any additional cost arising from a hike in the price of steel would likely be small on a unit basis. Therefore, the manufacturer and supplier would likely absorb the costs.

Some Say Yes — Components suppliers say that material is one of their largest expenses in many cases. They expressed the belief that anything more than a moderate increase in the cost of steel will have to be passed on to their customers. This is particularly true in the case of suppliers who furnish boxes and other components where the material content is high and the labor contact is comparately small.

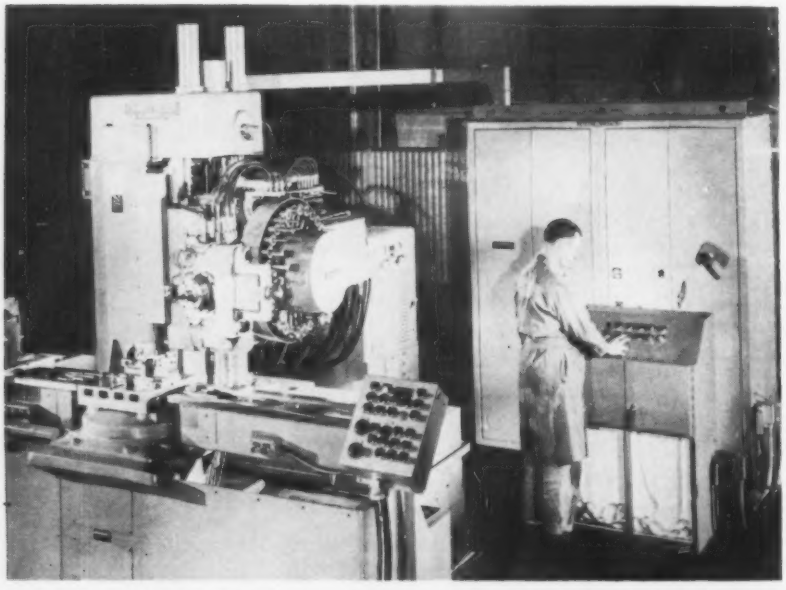
. . . But Generally No—In the case of manufacturers of switch boxes, conduit and other electrical and power control units used in residential and commercial construction, any increase in material costs will be reflected in their prices. They see no way to avoid it.

Generally, prices should remain stable through the summer. Where prices have just recently been raised, this stability should extend for a year or so, say the manufacturers.

There was ample evidence at a recent show in Detroit sponsored by the Electrical Manufacturers Representatives Assn. that the trend toward miniaturization of electrical and electronic controls is continuing. And controls are getting more complex. Today's customer needs more help, says one controlsmaker.

This company has correspondence courses for distributors, and training classes, and expects to do even more along these lines.

Makers feel they have done a pretty good job in reducing maintenance and space problems in recent years, but they say there is still room for progress.



BETTER BUSINESS: Electrical controls, like this General Electric console, are starting to really move after a slow year in 1958. Business in April topped anything last year, and May looks even better.

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July Order Books Are Filling in Fast

Buyers, disregarding any prospects of a strike, are busily booking July orders.

Mounting carryovers cause some mills to limit the third quarter tonnage they will accept.

▪ Mill order books for July are filling in rapidly.

Customers, ignoring the threat of a strike, are busily booking tonnage. In some cases, the interest extends beyond July into August. Most mills, even those which would be struck July 1, are taking the orders.

One factor is limiting order acceptance: The lengthening shadow of mill carryovers. This backlog of unfilled orders influences even the mills which are non-union or have contracts extending beyond June 30. (See story, p. 106.)

At best these carryovers will take half of July rolling time. And at their worst in the Midwest they will push June tonnage into August.

Because of carryover problems some mills are "screening" July orders. Customers are asked to enter only a portion of their normal tonnage. Other buyers, without order records at the mills, are being turned down cold.

Current activity in sheet, plate, bar and shapes is mainly in terms of third quarter ordering. It has to be with second quarter books closed out.

But other products are now catching fire. Demand for buttweld pipe has tightened that market rapidly. A few weeks ago most mills could offer delivery right out of stock. Now some producers are sold out for the second quarter. Others are quoting late June delivery—maybe.

Wire mills, too, are booking orders at a high level. Most of the tonnage is for July-August delivery.

Sheet and Strip — July sheet orders are coming in to mills at a brisk rate. "The order pace is much stronger than we thought it would be," says a **Pittsburgh** mill salesman. Behind the rising tide of orders is user anxiety to keep inventories up. One **East Coast** mill man reports a customer had a 60-day inventory two months ago. Today it's down to a 30-day supply. Customers at **Eastern** mills are booking cold-rolled sheet as far ahead as August.

Plates and Shapes—Plate mill backlogs on second quarter orders are growing. **Chicago** producers will probably go into July with carryovers of about 6 weeks. Situation is less critical at **Eastern** mills, but some backlogs exist. July plate bookings for most mills are good.

PURCHASING AGENT'S CHECKLIST

Used machinery dealers want check on government's method of selling surplus tools. P. 105

If there's a steel strike all mills won't close. Here's list of those which would probably still be operating. P. 106

New thermoplastic material has strength properties near those of nonferrous metals. P. 142

East Coast mills expect structural backlogs to move out from now on. Third quarter bookings are light. **Pittsburgh** producers believe orders for standard shapes will probably fall back after June.

Pipe and Tubing—Buttweld pipe sales have finally picked up as jobbers stock against a possible strike. But pipe mills are encouraged because consumption also seems to be increasing. Even at **East Coast** mills, where supplies are ample, deliveries have moved out from 1-2 weeks to 2-3 weeks. Outlook for linepipe and oil country seamless has not changed. Both products are booked solid for the second quarter and readily available in the third.

Wire Products—Pittsburgh Steel Co. has announced it will accept no new orders for fence, chain link fabric, barbed wire, nails, and gates. Production of these products will end during the third quarter when present orders are all shipped.

Reduced volume and profit margins in merchant wire products are responsible for the move, the company says. According to Pittsburgh the problem was one of advancing wage rates with large number of man hours needed in wire production. Low cost foreign competition has added to the difficulty.

Service Center Pricing — Three Pittsburgh distributors—U. S. Steel Supply, Ryerson, and Jones & Laughlin—are now using the new item quantity system of pricing. (See The IRON AGE, May 14, p. 113.) The method is expected to spread to **Cleveland** by the end of this week. One major outlet there, U. S. Steel Supply, has already announced item quantity pricing.

Stainless — Sheet producers say backlogs are still heavy but new orders have tapered off. Warehouse efforts to build stocks were apparently reduced by increased business.

Sheet pricing remains unstable. One mill man lists it as the "most confused state I have ever seen."

COMPARISON OF PRICES

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland Youngstown.

Price advances over previous week are printed in **Heavy Type**; declines appear in *Italics*.

	May 19 1959	May 12 1959	Apr. 21 1959	May 20 1958
Flat-Rolled Steel: (per pound)				
Hot-rolled sheets	5.10¢	5.10¢	5.10¢	4.925¢
Cold-rolled sheets	6.275	6.275	6.275	6.05
Galvanized sheets (10 ga.)	6.875	6.875	6.875	6.60
Hot-rolled strip	5.10	5.10	5.10	4.925
Cold-rolled strip	7.425	7.425	7.425	7.17
Plate	5.30	5.30	5.30	5.12
Plates, wrought iron	13.55	13.55	13.55	13.15
Stainl's C-R strip (No. 302)	52.00	52.00	52.00	52.00
Tin and Terneplate: (per base box)				
Tinplate (1.50 lb.) cokes	$10.65	$10.65	$10.65	$10.30
Tin plates, electro (0.50 lb.)	9.35	9.35	9.35	9.00
Special coated mfg. ternes	9.90	9.90	9.90	9.55
Bars and Shapes: (per pound)				
Merchant bar	5.675¢	6.675¢	5.675¢	5.425¢
Cold finished bar	7.65	7.65	7.65	7.30
Alloy bars	6.725	6.725	6.725	6.475
Structural shapes	5.50	5.50	5.50	5.275
Stainless bars (No. 302)	46.75	46.75	45.00	45.00
Wrought iron bars	14.90	14.90	14.90	14.45
Wire: (per pound)				
Bright wire	8.00¢	8.00¢	8.00¢	7.65¢
Rails: (per 100 lb.)				
Heavy rails	$5.75	$5.75	$5.75	$5.525
Light rails	6.725	6.725	6.725	6.50
Semifinished Steel: (per net ton)				
Rerolling billets	$80.00	$80.00	$80.00	$77.50
Slabs, rerolling	80.00	80.00	80.00	77.50
Forging billets	99.50	99.50	99.50	96.00
Alloys blooms, billets, slabs	119.00	119.00	119.00	114.00
Wire Rods and Skelp: (per pound)				
Wire rods	6.40¢	6.40¢	6.40¢	6.15¢
Skelp	5.05	5.05	5.05	4.875
Finished Steel Composite: (per pound)				
Base price	6.196¢	6.196¢	6.196¢	5.967¢

(Effective May 19, 1959)

	May 19 1959	May 12 1959	Apr. 21 1959	May 20 1958
Pig Iron: (per gross ton)				
Foundry, del'd Phila.	$70.57	$70.57	$70.57	$70.97
Foundry, Southern Cin'ti	73.87	73.87	73.87	73.87
Foundry, Birmingham	62.50	62.50	62.50	62.50
Foundry, Chicago	66.50	66.50	66.50	66.50
Basic, del'd Philadelphia	70.07	70.07	70.07	70.47
Basic, Valley furnace	66.00	66.00	66.00	66.00
Malleable, Chicago	66.50	66.50	66.50	66.50
Malleable, Valley	66.50	66.50	66.50	66.50
Ferromanganese, 74-76 pct Mn, cents per lb‡	12.25	12.25	12.25	12.25
Pig Iron Composite: (per gross ton)				
Pig iron	$66.41	$66.41	$66.41	$66.49
Scrap: (per gross ton)				
No. 1 steel, Pittsburgh	**$37.50**	$36.50	$38.50	$35.50
No. 1 steel, Phila. area	33.50	33.50	33.50	34.00
No. 1 steel, Chicago	31.50	31.50	32.50	32.50
No. 1 bundles, Detroit	31.50	31.50	31.50	23.50
Low phos., Youngstown	38.50	38.50	38.00	37.50
No. 1 mach'y cast, Pittsburgh	49.50	49.50	49.50	48.50
No. 1 mach'y cast, Phila.	49.50	49.50	49.50	47.50
No. 1 mach'y cast, Chicago	**54.50**	53.50	51.50	44.50
Steel Scrap Composite: (per gross ton)				
No. 1 hvy. melting scrap	**$34.17**	$33.83	$34.83	$34.00
No. 2 bundles	**23.50**	22.83	23.17	25.50
Coke, Connellsville: (per net ton at oven)				
Furnace coke, prompt	$14.50-15.50	$14.50-15.50	$14.50-15.50	$15.38
Foundry, coke, prompt	18.50	18.50	18.50	17.50-19
Nonferrous Metals: (cents per pound to large buyers)				
Copper, electrolytic, Conn.	31.50	31.50	31.50	25.00
Copper, Lake, Conn.	31.50	31.50	31.50	25.00
Tin, Straits, N. Y.	**103.50†**	102.875*	102.00	94.25
Zinc, East St. Louis	11.00	11.00	11.00	10.00
Lead, St. Louis	11.80	11.80	11.30	11.30
Aluminum, virgin ingot	26.80	26.80	26.80	26.10
Nickel, electrolytic	74.00	74.00	74.00	74.00
Magnesium, ingot	36.00	36.00	36.00	36.00
Antimony, Laredo, Tex.	29.50	29.50	29.50	29.50

† Tentative. ‡ Average. * Revised.

Finished Steel Composite

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold rolled sheets and strips.

Pig Iron Composite

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo and Birmingham.

Steel Scrap Composites

Average of No. 1 heavy melting steel scrap and No. 2 bundles delivered to consumers at Pittsburgh, Philadelphia and Chicago.

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Prices Hit Bottom And Firm Up

Dealers appear determined to resist any further attempts to lower prices.

Much of their prime material is cleaned out. Export sets pace in the East.

■ Any way you look at it, the scrap market today spells "bottom."

Scrap sources have all but dried up. The large majority of dealers appear unwilling to part with material at lower-than-quoted prices.

Here and there a flicker of strength shows through as a mill makes an occasional buy. Invariably, the mill pays quoted or slightly higher prices.

One of these flickers of strength appeared in Pittsburgh this week, where a mill bought openhearth material at $1 to $2 higher than quoted prices.

And in Chicago, mill offers to buy steelmaking scrap at $2 lower failed to weaken the market there. On the contrary, No. 2 heavy melting rose $1 on a sale and electric furnace grades rose $2.

There is still time for one last scrap buying splurge before the June 30 steel strike deadline. Mills are not generally expected to make any large scrap purchases after June 15—unless a new labor contract is signed by that time, which is unlikely.

Based on the buying activity in Pittsburgh, The IRON AGE No. 1 heavy melting Composite Price moved up 34¢ to $34.17.

Pittsburgh—Prices of openhearth grades rose $1 to $2 here as a local mill bought No. 1 dealer bundles at prices ranging from $39 to $41 and No. 2 bundles at $26 to $28. The market already was tightening before the order was placed. Brokers were paying the full price on old orders for No. 2 bundles. Low prices had dried up the local supply. Increased activity elsewhere made it impossible to bring scrap into the district without paying more money.

Chicago—Scrap tightened slightly this week. No. 2 heavy melting moved at $1 higher. Electric furnace grades gained $2 on new sales. Cast showed greater strength. Mill offers to buy at $2 below the new prices failed to weaken the market. Rail grades — despite strengthening in electric furnace prices—failed to show gains and new sales at existing prices were again reported.

Philadelphia — Export continues to hold up the market for openhearth scrap. Domestic buying is practically nil for these grades and for turnings. The cast market is fairly active. Foundry grades are holding firm, but heavy breakable cast dropped $1 on a mill purchase.

New York—Export continues to be the big gun in this market. Reported arrival of more boats for loading has firmed prices but not yet raised them. Domestic business is down to a trickle. Prices are unchanged.

Detroit — Scrap is moving on earlier orders but no new action has developed. However, dealers have postponed general gloom over the market outlook until at least the middle of next month. They expect mills to buy in June for shipment in the first 15 to 20 days.

Cleveland—Prime dealer scrap is fairly scarce since it was all most dealers could sell off in recent months. A large tonnage order would increase prices, but none is in sight. Plate scrap buyers have had to raise prices and are finding little available at any figure. Market is generally stable with tonnage moving on special orders. Auto lists will take sharper-than-usual bidding since mills will want delivery before June 15.

St. Louis—Flow of scrap into dealer yards slowed somewhat during the week. Mills were making small purchases for delivery prior to the middle of June. Volume was below last week's pace.

Birmingham — There is only limited buying of scrap at lower prices in view of the possible steel strike. An Atlanta mill placed orders at $2 a ton under its last price for openhearth scrap. Brokers reduced prices on heavy melting grades, except for No. 2 bundles.

Cincinnati — Scrap is becoming increasingly harder to buy as dealers hold off for price reasons. Movement has slowed down and most feel the market has bottomed.

Buffalo—Only activity here was sales of low phos plate which raised price of that item to $38-$39. Other items are unchanged. Most dealers feel prices are near or at bottom.

Boston — Inactivity continues in this market. Very little material is moving. Prices are unchanged.

West Coast—There is little scrap moving in the three major West Coast markets, but it's enough for domestic and export requirements. Cast is holding firm.

Houston—Market is in the doldrums and signs are it will remain that way until at least after June 15. The district mill is expected to be out of the market until that time. Scrap intake is slow.

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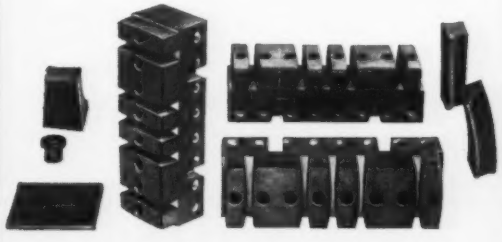

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SCRAP PRICES *(Effective May 19, 1959)*

Iron and Steel Scrap

Going prices of iron and steel scrap as obtained in the trade by THE IRON AGE based on representative tonnages. All prices are per gross ton delivered to consumer unless otherwise noted.

Pittsburgh

No. 1 hvy. melting	$37.00 to $38.00
No. 2 hvy. melting	30.00 to 31.00
No. 1 dealer bundles	40.00 to 41.00
No. 1 factory bundles	43.00 to 44.00
No. 2 bundles	27.00 to 28.00
No. 1 busheling	38.00 to 39.00
Machine shop turn.	19.00 to 20.00
Shoveling turnings	26.00 to 27.00
Cast iron borings	25.00 to 26.00
Low phos. punch'gs plate	44.00 to 45.00
Heavy turnings	31.00 to 32.00
No. 1 RR hvy. melting	41.00 to 42.00
Scrap rails, random lgth.	49.00 to 50.00
Rails 2 ft and under	54.00 to 55.00
RR specialties	47.00 to 48.00
No. 1 machinery cast.	49.00 to 50.00
Cupola cast.	43.00 to 44.00
Heavy breakable cast.	41.00 to 42.00
Stainless	
18-8 bundles and solids	230.00 to 235.00
18-8 turnings	115.00 to 120.00
430 bundles and solids	130.00 to 135.00
410 turnings	55.00 to 60.00

Chicago

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	29.00 to 30.00
No. 1 dealer bundles	32.00 to 33.00
No. 1 factory bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	31.00 to 32.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	17.00 to 18.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Low phos. forge crops	46.00 to 47.00
Low phos, punch'gs plate, ¼ in. and heavier	43.00 to 44.00
Low phos. 2 ft and under	41.00 to 42.00
No. 1 RR hvy. melting	36.00 to 37.00
Scrap rails, random lgth.	42.00 to 43.00
Rerolling rails	54.00 to 55.00
Rails 2 ft and under	51.00 to 52.00
Angles and splice bars	46.00 to 47.00
RR steel car axles	62.00 to 63.00
RR couplers and knuckles	44.00 to 45.00
No. 1 machinery cast.	54.00 to 55.00
Cupola cast.	47.00 to 48.00
Cast iron wheels	38.00 to 39.00
Malleable	55.00 to 56.00
Stove plate	45.00 to 46.00
Steel car wheels	43.00 to 44.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	110.00 to 115.00
430 bundles and solids	115.00 to 120.00
430 turnings	55.00 to 60.00

Philadelphia Area

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	36.00 to 37.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	35.00 to 36.00
Machine shop turn.	17.00 to 18.00
Mixed bor. short turn.	17.00 to 18.00
Cast iron borings	17.00 to 18.00
Shoveling turnings	23.00 to 24.00
Clean cast. chem. borings	26.00 to 27.00
Low phos. 5 ft and under	37.00 to 40.00
Low phos. 2 ft punch'gs	39.00 to 42.00
Elec. furnace bundles	38.00 to 39.00
Heavy turnings	32.00 to 33.00
RR specialties	42.00 to 43.00
Rails 18 in. and under	58.00 to 60.00
Cupola cast.	40.00 to 41.00
Heavy breakable cast.	41.00 to 42.00
Cast iron car wheels	44.00 to 45.00
Malleable	67.00 to 68.00
No. 1 machinery cast.	49.00 to 50.00

Cincinnati

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$31.50 to $32.50
No. 2 hvy. melting	26.50 to 27.50
No. 1 dealer bundles	31.50 to 32.50
No. 2 bundles	20.00 to 21.00
Machine shop turn.	14.00 to 15.00
Shoveling turnings	17.00 to 18.00
Cast iron borings	16.00 to 17.00
Low phos. 18 in. and under	40.00 to 41.00
Rails, random length	46.00 to 47.00
Rails, 18 in. and under	53.00 to 54.00
No. 1 cupola cast.	43.00 to 44.00
Hvy. breakable cast.	40.00 to 41.00
Drop broken cast.	48.00 to 49.00

Youngstown

No. 1 hvy. melting	$36.50 to $37.50
No. 2 hvy. melting	30.50 to 31.50
No. 1 dealer bundles	36.50 to 37.50
No. 2 bundles	24.00 to 25.00
Machine shop turn.	18.50 to 19.50
Shoveling turnings	23.50 to 24.50
Low phos. plate	38.00 to 39.00

Cleveland

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	27.00 to 28.00
No. 1 dealer bundles	33.00 to 34.00
No. 1 factory bundles	38.00 to 39.00
No. 2 bundles	22.00 to 23.00
No. 1 busheling	33.00 to 34.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	20.00 to 21.00
Shoveling turnings	20.00 to 21.00
Cast iron borings	20.00 to 21.00
Cut structural & plates, 2 ft & under	40.00 to 41.00
Drop forge flashings	33.00 to 34.00
Low phos. punch'gs plate	34.00 to 35.00
Foundry steel, 2 ft & under	35.00 to 36.00
No. 1 RR hvy. melting	36.00 to 37.00
Rails 2 ft and under	55.00 to 56.00
Rails 18 in. and under	56.00 to 57.00
Steel axle turnings	24.00 to 25.00
Railroad cast.	53.00 to 54.00
No. 1 machinery cast.	51.00 to 52.00
Stove plate	48.00 to 49.00
Malleable	66.00 to 67.00
Stainless	
18-8 bundles	215.00 to 225.00
18-8 turnings	115.00 to 120.00
430 bundles	120.00 to 125.00

Buffalo

No. 1 hvy. melting	$31.00 to $32.00
No. 2 hvy. melting	26.00 to 27.00
No. 1 busheling	31.00 to 32.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	22.00 to 23.00
Machine shop turn.	15.00 to 16.00
Mixed bor. and turn.	16.00 to 17.00
Shoveling turnings	19.00 to 20.00
Cast iron borings	16.00 to 17.00
Low phos. plate	38.00 to 39.00
Structurals and plate, 2 ft and under	41.00 to 42.00
Scrap rails, random lgth.	39.00 to 40.00
Rails 2 ft and under	49.00 to 50.00
No. 1 machinery cast.	48.00 to 49.00
No. 1 cupola cast.	44.00 to 45.00

St. Louis

No. 1 hvy. melting	$33.00 to $34.00
No. 2 hvy. melting	31.00 to 32.00
No. 1 dealer bundles	37.00 to 38.00
No. 2 bundles	21.00 to 22.00
Machine shop turn.	12.00 to 13.00
Shoveling turnings	14.00 to 15.00
Cast iron borings	18.00 to 19.00
No. 1 RR hvy. melting	37.00 to 38.00
Rails, random lengths	43.00 to 44.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	44.00 to 45.00
RR specialties	42.00 to 43.00
Cupola cast.	48.00 to 49.00
Heavy breakable cast.	40.00 to 41.00
Cast iron brake shoes	38.00 to 39.00
Stove plate	43.00 to 44.00
Cast iron car wheels	40.00 to 41.00
Rerolling rails	53.00 to 54.00
Unstripped motor blocks	41.00 to 42.00

Birmingham

No. 1 hvy. melting	$28.00 to $29.00
No. 2 hvy. melting	21.00 to 22.00
No. 1 dealer bundles	28.00 to 29.00
No. 2 bundles	21.00 to 22.00
No. 1 busheling	28.00 to 29.00
Machine shop turn.	20.00 to 21.00
Shoveling turnings	21.00 to 22.00
Cast iron borings	14.00 to 15.00
Electric furnace bundles	34.00 to 35.00
Elec. furnace, 3 ft & under	32.00 to 33.00
Bar crops and plate	38.00 to 39.00
Structural and plate, 2 ft.	38.00 to 39.00
No. 1 RR hvy. melting	33.00 to 34.00
Scrap rails, random lgth.	40.00 to 41.00
Rails, 18 in. and under	48.00 to 49.00
Angles and splice bars	42.00 to 43.00
Rerolling rails	52.00 to 53.00
No. 1 cupola cast.	53.00 to 54.00
Stove plate	53.00 to 54.00
Cast iron car wheels	39.00 to 40.00
Unstripped motor blocks	40.00 to 41.00

New York

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$26.00 to $27.00
No. 2 hvy. melting	21.00 to 22.00
No. 2 dealer bundles	15.00 to 16.00
Machine shop turnings	9.00 to 10.00
Mixed bor. and turn.	11.00 to 12.00
Shoveling turnings	13.00 to 14.00
Clean chem. cast. borings	20.00 to 21.00
No. 1 machinery cast.	37.00 to 38.00
Mixed yard cast.	35.00 to 36.00
Heavy breakable cast.	33.00 to 34.00
Stainless	
18-8 prepared solids	195.00 to 200.00
18-8 turnings	85.00 to 90.00
430 prepared solids	85.00 to 90.00
430 turnings	20.00 to 25.00

Detroit

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$29.00 to $30.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	31.00 to 32.00
No. 2 bundles	17.00 to 18.00
No. 1 busheling	29.00 to 30.00
Drop forge flashings	28.00 to 29.00
Machine shop turn.	11.00 to 12.00
Mixed bor. and turn.	12.00 to 13.00
Shoveling turnings	13.00 to 14.00
Cast iron borings	12.00 to 13.00
Heavy breakable cast.	31.00 to 32.00
Mixed cupola cast.	41.00 to 42.00
Automotive cast.	47.00 to 48.00
Stainless	
18-8 bundles and solids	210.00 to 215.00
18-8 turnings	100.00 to 105.00
430 bundles and solids	100.00 to 105.00

Boston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$24.00 to $25.00
No. 2 hvy. melting	20.00 to 21.00
No. 1 dealer bundles	24.00 to 25.00
No. 2 bundles	12.00 to 13.00
No. 1 busheling	24.00 to 25.00
Machine shop turn.	6.00 to 7.00
Shoveling turnings	11.00 to 12.00
Clean cast. chem. borings	16.00 to 17.00
No. 1 machinery cast.	33.00 to 34.00
Mixed cupola cast.	33.00 to 34.00
Heavy breakable cast.	31.00 to 32.00
Stove plate	29.00 to 30.00

San Francisco

No. 1 hvy. melting	$36.00
No. 2 hvy. melting	33.00
No. 1 dealer bundles	33.00
No. 2 bundles	22.00
Machine shop turn.	17.00
Cast iron borings	17.00
No. 1 cupola cast.	45.00

Los Angeles

No. 1 hvy. melting	$38.00
No. 2 hvy. melting	36.00
No. 1 dealer bundles	35.00
No. 2 bundles	18.00
Machine shop turn.	$16.00 to 17.00
Shoveling turnings	18.00 to 19.00
Cast iron borings	18.00 to 19.00
Elec. furn. 1 ft and under (foundry)	49.00
No. 1 cupola cast.	45.00

Seattle

No. 1 hvy. melting	$35.00
No. 2 hvy. melting	33.00
No. 2 bundles	22.00
No. 1 cupola cast.	36.00
Mixed yard cast.	36.00

Hamilton, Ont.

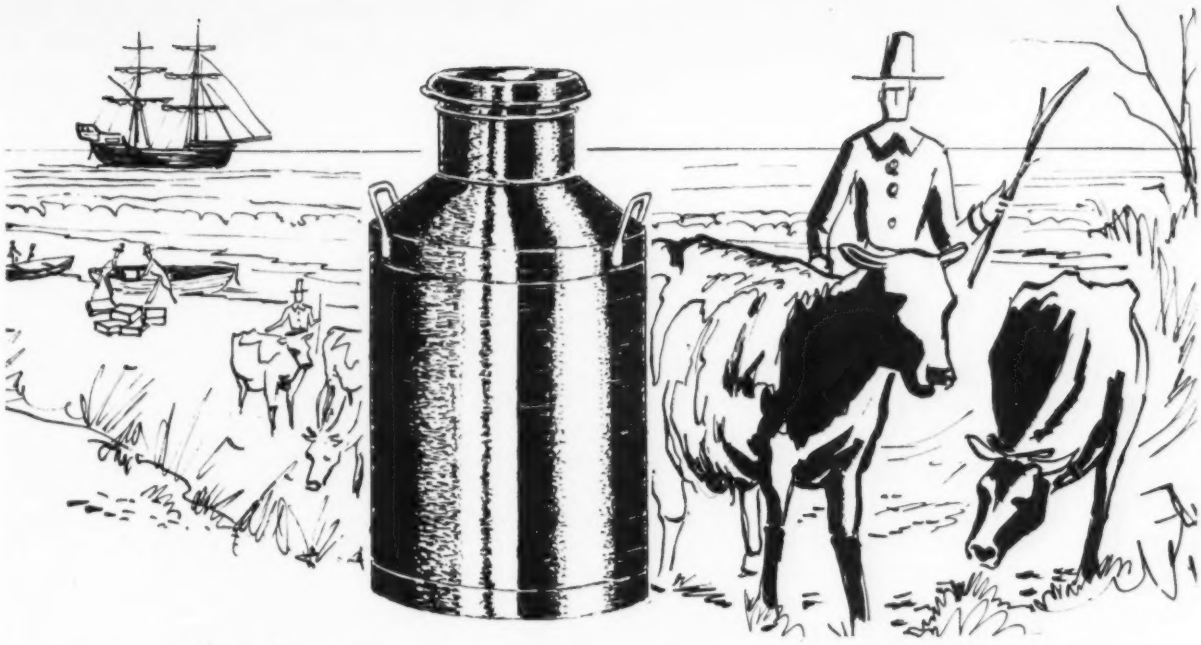
Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$32.25
No. 2 hvy. melting	28.25
No. 1 dealer bundles	32.25
No. 2 bundles	22.75
Mixed steel scrap	24.25
Bush., new fact., prep'd.	32.25
Bush., new fact., unprep'd	26.25
Machine shop turn.	14.00
Shortsteel turn.	17.00
Mixed bor. and turn.	13.00
Rails, rerolling	37.00
Cast scrap	$46.50 to 48.00

Houston

Brokers buying prices per gross ton on cars:

No. 1 hvy. melting	$34.00
No. 2 hvy. melting	31.00
No. 2 bundles	20.00
Machine shop turn.	16.00
Shoveling turnings	20.00
Cut structural plate 2 ft & under	$44.00 to 45.00
Unstripped motor blocks	37.00 to 38.00
Cupola cast.	44.00 to 45.00
Heavy breakable cast.	28.00 to 29.00



to fill the nation's milk bottles

In Ur of Chaldee, a frieze from 3500 B. C. depicted milk containers and strainers. Ancient Egypt drank milk; and the Romans used it as a beverage, for cheese and other dairy products. Norsemen brought cattle to new lands, but it was not until 1624, when the good ship Charity transported cows to the hungry colonists in Plymouth, that dairying became part of a permanent settlement.

Growth of American dairying to a major food industry has been marked by the invention of the centrifugal cream separator in 1878, the milk bottle in 1884, the automatic bottle filler and capper in 1886, and pasteurizing machines in 1895.

Today, the dairy industry depends not alone on the cow—it demands steel for buildings, for machines, tank cars and trucks. To make and market the country's milk, butter, cheese and ice cream, and for countless other civilian and military needs, a continuing tonnage of iron and steel must be available—and scrap is an indispensable ingredient.

For the purchase

or sale of

iron or steel scrap

. . . phone or write

"Your Chicago Broker"

M. S.
KAPLAN
COMPANY

231 S. La Salle St., Chicago

Telephone ANdover 3-3900

Aluminum Users Are Hedging

But buyers are mostly stocking up against expected higher operating rates rather than a strike.

The producers are taking the whole market well in stride.

▪ Is there any hedging or inventory building in aluminum? Here's what some leading factors in the market say.

"I had lunch with a regular customer the other day," said a leading aluminum seller. "He had boosted his latest order slightly over the previous few, so I asked him about it.

"He said business was looking up so he had decided to up his aluminum inventory—to 15 days. I asked if this wasn't still a bit short, and he said it was rock-bottom minimum."

Warehouse Buying — An aluminum warehouseman reports, "Not one in twenty of my customers is hedging. But most are small buyers who can't afford to get much cash tied up in inventory. I called a mill the other day, but they were too busy to ship what and when I wanted. I believe there is a lot of hedge buying at the mill level."

An independent aluminum mill isn't increasing its stocks of aluminum. "But don't misunderstand me," explained one of its top executives. "We've covered ourselves pretty well. But we placed our orders months ago. Then too, we have a contract for aluminum from Alcan." (Canadian producer's labor contracts expire later than those of U. S. companies.)

Business Is Good — This mill doesn't think many of its customers are hedging. But then they don't have much room since the mill has been at peak output since about the beginning of the year.

Is there hedge buying? Definitely. But most seems to be inventory building anticipating increased operating rates rather than a strike.

Is the hedging straining U. S. producers? Not a bit, especially at the primary level. Ingot buyers are usually companies big enough to have taken long term-action to avoid disturbing the market.

At the mill level, where there are more smaller customers, there seems to be a little strain, but no suggestion of any real bind.

Look Both Ways—Labor talks this year at the very least are likely to be noted for their organization and flexibility.

This is the first time the three major companies have pacts expiring at the same time. They will negotiate separately. This means both the management and union men will have to keep a very close eye on what the other sessions are doing, as well as watching for steel's settlement.

They Say . . .

In a speech prepared for delivery tonight (Thursday) to the Philadelphia Metals Assn., Harry Gumpert, asst. vice president, Brandeis, Goldschmidt and Co., Inc., New York metal traders, says of the European market for U. S. nonferrous metals, "I do not foresee an improvement before perhaps the end of the year."

Mr. Gumpert is just back from a business trip around the world.

Government Copper—William A. Meissner, Jr., Director of the Copper Div., Business and Defense Services Administration gave a solid, down-to-earth explanation of the prospects of the government selling copper on the open market, to a meeting of the New England Div., National Assn. of Waste Material Dealers.

"As long as the government has a surplus of copper, the possibility of a program of disposal is something the industry will always have to bear in mind.

"The disposal of DPA inventory of materials which are surplus to stockpile requirements is governed by Defense Mobilization order V-3, which requires that generally there be public announcement well in advance of the sale which gives: 1. The total quantity to be sold. 2. The market in which offers shall be made. 3. The minimum market prices that must prevail at time of sale. 4. The maximum amounts to be offered in a given period."

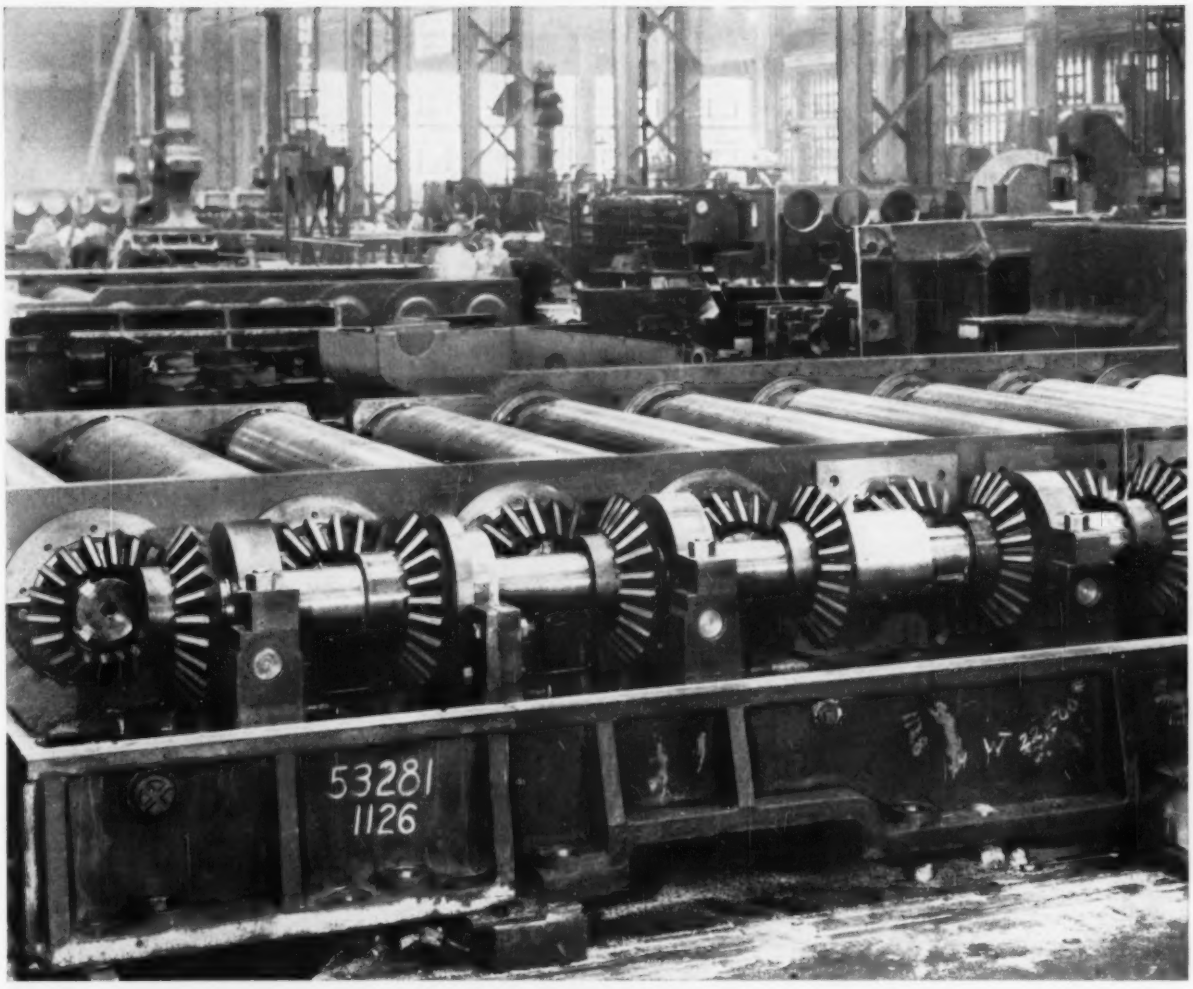
Tin prices for the week: May 13—103.00; May 14—103.25; May 15 — 103.25; May 18 — 103.25; May 19—103.50.*

*Estimate.

Primary Prices

(cents per lb)	current price	last price	date of change
Aluminum pig	24.70	24.00	8/1/58
Aluminum ingot	26.80	26.10	8/1/58
Copper (E)	31.50	30.00	3/9/59
Copper (CS)	32.00	32.50	4/30/59
Copper (L)	31.50	30.00	3/9/59
Lead, St. L.	11.80	11.30	5/7/59
Lead, N. Y.	12.00	11.50	5/7/59
Magnesium ingot	38.00	34.50	8/13/58
Magnesium pig	35.25	33.75	8/13/58
Nickel	74.00	64.50	12/8/58
Titanium sponge	162-182	185-205	11/3/58
Zinc, E. St. L.	11.00	11.50	2/25/59
Zinc, N. Y.	11.50	12.00	2/25/59

ALUMINUM: 99% Ingot frt allwd. COPPER: (E) = electrolytic, (CS) = custom smelters, electrolytic. (L) = lake. LEAD: common grade. MAGNESIUM: 99.8% pig Velasco, Tex. NICKEL: Port Colborne, Canada. ZINC: prime western. TIN: See above; Other primary prices, pg. 196.



The AISI 4340 steel in these gears gives you strength, toughness, and reliability. It's readily annealed, yet it can be machined at fairly high hardness levels. It welds easily with appropriate procedures and responds reliably to heat treatment.

Gears of 4340 Nickel alloy steel keep slabbing mills rolling . . . dependably

How well do heavy-duty gears of 4340 Nickel alloy steel perform?

United Engineering and Foundry Company reports, "4340 Nickel-alloyed steel mill gears are still on the job after three years' service."

You can expect maximum performance from 4340 through-hardening steel because of its excellent combination of strength and toughness when properly heat treated. Its high hardenability insures uniform properties in parts like gears which have different section sizes.

4340 through-hardening Nickel alloy steel may be the answer to your own parts problem where moderate-to-heavy sections are involved. You'll find this steel easy to process and readily available from Steel Service Centers throughout the country.

Technical information on 4340 and other Nickel-alloyed steels is readily available, too. Just ask us for the facts you want.

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street New York 5, N. Y.

INCO NICKEL

NICKEL MAKES ALLOYS PERFORM BETTER LONGER

MILL PRODUCTS

(Cents per lb unless otherwise noted)

ALUMINUM

(Base 30,000 lb, f.o.b. ship pt., frt. allowed)

Flat Sheet (Mill Finish and Plate)

("F" temper except 6061-0)

Alloy	.032	.081	.136-.249	.250-3
1100, 3003	45.7	43.8	42.8	43.3
5052	53.1	48.4	46.9	46.0
6061-0	50.1	45.7	43.9	44.9

Extruded Solid Shapes

Factor	6063 T-5	6062 T-6
6-8	42.7-44.2	51.1-54.8
12-14	42.7-44.2	52.0-56.5
24-26	43.2-44.7	62.8-67.5
36-38	46.7-49.2	86.9-90.5

Screw Machine Stock—2011-T-3

Size"	¼	⅜-⅝	¾-1	1¼-1½
Price	62.0	61.2	59.7	57.3

Roofing Sheet, Corrugated

(Per sheet, 26" wide base, 16,000 lb)

Length"→	72	96	120	144
.019 gage	$1.411	$1.884	$2.353	$2.823
.024 gage	1.762	2.349	2.937	3.524

MAGNESIUM

(F.o.b. shipping Pt., carload frt. allowed)

Sheet and Plate

Type→ Gage→	.250 3.00	.250-2.00	.188	.081	.032
AZ31B Stand. Grade	.....	67.9	69.0	77.9	103.1
AZ31B Spec.	.....	93.3	95.7	108.7	171.3
Tread Plate	.....	70.6	71.7	.....	.....
Tooling Plate	73.0	.....	.....	.....	.....

Extruded Shapes

factor→	6-8	12-14	24-26	36-38
Comm. Grade (AZ31C)	65.3	65.3	66.1	71.5
Spec. Grade (AZ31B)	84.6	85.7	90.6	104.2

Alloy Ingot

AZ91B (Die Casting) ..... 37.25 (delivered)
AZ63A, AZ92A, AZ91C (Sand Casting) 40.75 (Velasco, Tex.)

NICKEL, MONEL, INCONEL

(Base prices f.o.b. mill)

	"A" Nickel	Monel	Inconel
Sheet, CR	126	106	128
Strip, CR	124	108	138
Rod, bar, HR	107	89	109
Angles, HR	107	89	109
Plates, HR	120	105	121
Seamless tube	157	129	200
Shot, blocks	...	87	...

COPPER, BRASS, BRONZE

(Freight included in 5000 lbs)

	Sheet	Wire	Rod	Tube
Copper	55.63	.....	52.86	55.82
Brass, Yellow	48.24	48.75	48.18	51.05
Brass, Low	51.23	51.77	51.17	54.54
Brass, R L	52.29	52.83	52.23	55.60
Brass, Naval	52.80	.....	46.61	56.21
Muntz Metal	50.85	.....	46.16	.....
Comm. Bz.	53.90	54.44	53.84	56.96
Mang. Bz.	56.54	.....	50.14	.....
Phos. Bz. 5%	75.34	.....	75.84	.....

Free Cutting Brass Rod 32.73

TITANIUM

(Base prices, f.o.b. mill)

Sheet and strip, commercially pure, $6.90-$7.40; alloy, $14.35. Plate, HR, commercially pure, $5.00-$5.75; alloy, $7.75-$8.50. Wire, rolled and/or drawn, commercially pure, $5.50-$6.00; alloy, $8.00-$9.50; Bar, HR or forged, commercially pure, $4.25-$4.65; alloy, $4.25-$7.15; billets, HR, commercially pure, $3.55-$4.10; alloy, $3.55-$5.75.

PRIMARY METAL

(Cents per lb unless otherwise noted)

Antimony, American, Laredo, Tex.. 29.50
Beryllium Aluminum 5% Be, Dollar per lb contained Be $74.75
Beryllium copper, per lb cont'd Be. $43.00
Beryllium 97% lump or beads, f.o.b. Cleveland, Reading $71.50
Bismuth, ton lots ..... $ 2.25
Cadmium, del'd ..... $ 1.30
Calcium, 99.9% small lots ..... $ 4.55
Chromium, 99.8% metallic basis... $ 1.31
Cobalt, 97-99% (per lb) .... $1.75 to $1.82
Germanium, per gm, f.o.b. Miami, Okla., refined ..... 35.00 to 42.00
Gold, U. S. Treas., per troy oz. $35.00
Indium, 99.9%, dollars per troy oz.. $ 2.25
Iridium, dollars per troy oz. ... $75 to $85
Lithium, 98% ..... $11.00 to $14.00
Magnesium, sticks, 100 to 500 lb.... 59.00
Mercury, dollars per 76-lb flask f.o.b. New York ..... $245 to $249
Nickel oxide sinter at Buffalo, N. Y., or other U. S. points of entry, contained nickel 69.60
Palladium, dollars per troy oz.. $18 to $20
Platinum, dollars per troy oz... $77 to $80
Rhodium ..... $120.00 to $125.00
Silver ingots (¢ per troy oz.) 91.375
Thorium, per kg. $43.00
Vanadium ..... $ 3.45
Zirconium sponge ..... $ 5.00

REMELTED METALS

Brass Ingot

(Cents per lb delivered, carloads)

85-5-5 ingot
- No. 115 ..... 30.25
- No. 120 ..... 29.00
- No. 123 ..... **28.00**

80-10-10 ingot
- No. 305 ..... 34.50
- No. 315 ..... 32.50

88-10-2 ingot
- No. 210 ..... 43.50
- No. 215 ..... 39.25
- No. 245 ..... 35.00

Yellow ingot
- No. 405 ..... 24.75

Manganese bronze
- No. 421 ..... 27.75

Aluminum Ingot

(Cents per lb del'd 30,000 lb and over)

95-5 aluminum-silicon alloys
- 0.30 copper max. 24.75-25.00
- 0.60 copper max. 24.50-24.75

Piston alloys (No. 122 type).. 24.25-25.25
No. 12 alum. (No. 2 grade)... 21.50-22.00
108 alloy 22.00-22.50
195 alloy 25.00-26.00
13 alloy (0.60 copper max.)... 24.25-24.75
AXS-679 (1 pct zinc) 21.75-22.25

Steel deoxidizing aluminum notch bar granulated or shot

Grade 1—95-97½% 22.50-23.50
Grade 2—92-95% 21.25-22.25
Grade 3—90-92% 20.25-21.25
Grade 4—85-90% 17.50-18.50

SCRAP METALS

Brass Mill Scrap

(Cents per pound, add 1¢ per lb for shipments of 20,000 lb and over)

	Heavy	Turnings
Copper	27½	26⅝
Yellow brass	20⅝	18¾
Red brass	24¼	23½
Comm. bronze	25⅛	24⅜
Mang. bronze	19⅛	18⅜
Free cutting rod ends.	20½	

Customs Smelters Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27¾
No. 2 copper wire	26¼
Light copper	24¼
*Refinery brass	25¾
Copper bearing material	25

*Dry copper content.

Ingot Makers Scrap

(Cents per pound carload lots, delivered to refinery)

No. 1 copper wire	27¾
No. 2 copper wire	26¼
Light copper	24¼
No. 1 composition	22
No. 1 comp. turnings	21½
Hvy. yellow brass solids	16
Brass pipe	16½
Radiators	17

Aluminum

Mixed old cast.	13	—14
Mixed new clips	16	—17
Mixed turnings, dry	14	—15

Dealers' Scrap

(Dealers' buying price f.o.b. New York in cents per pound)

Copper and Brass

No. 1 copper wire	25	—25½
No. 2 copper wire	23	—23½
Light copper	21	—21½
Auto radiators (unsweated)	14½	—15
No. 1 composition	19	—19½
No. 1 composition turnings	17½	—18
Cocks and faucets	15	—15½
Clean heavy yellow brass	13½	—13¾
Brass pipe	15	—15½
New soft brass clippings	15¾	—16¼
No. 1 brass rod turnings	13	—13½

Aluminum

Alum. pistons and struts	6	— 6½
Aluminum crankcase	9½	—10
1100 (2s) aluminum clippings	13	—13½
Old sheet and utensils	9½	—10
Borings and turnings	6	— 6½
Industrial castings	9½	—10
2020 (24S) clippings	11	—11½

Zinc

New zinc clippings	4¾	— 5¼
Old zinc	3¼	— 3½
Zinc routings	2	— 2¼
Old die cast scrap	1¾	— 2

Nickel and Monel

Pure nickel clippings	52-54
Clean nickel turnings	37-40
Nickel anodes	52-54
Nickel rod ends	52-54
New Monel clippings	30-32
Clean Monel turnings	30-32
Old sheet Monel	26-28
Nickel Silver clippings, mixed	18
Nickel silver turnings, mixed	15

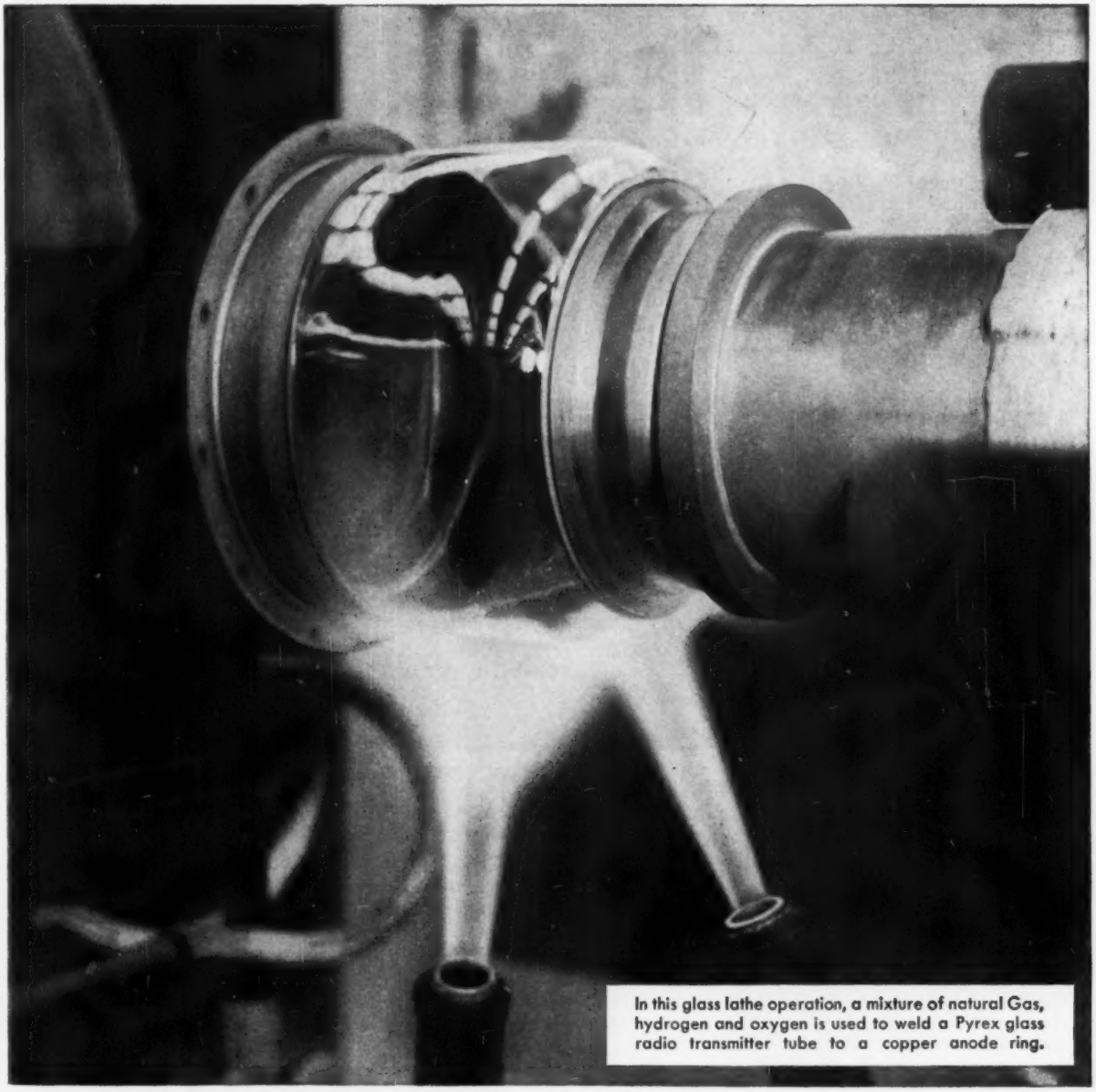
Lead

Soft scrap lead	7	— 7¼
Battery plates (dry)	2	— 2¼
Batteries, acid free	1⅞	— 2⅛

Miscellaneous

Block tin	77	—78
No. 1 pewter	59	—60
Auto babbitt	40	—41
Mixer common babbitt	9½	—10
Solder joints	13¼	—13¾
Siphon tops		42
Small foundry type	9½	—10
Monotype	9½	—10
Lino. and stereotype	8½	— 9
Electrotype	7	— 7½
Hand picked type shells	5¼	— 5¾
Lino. and stereo. dross	2¼	— 2¾
Electro dross	2¼	— 2¾

(Effective May 18, 1959)



In this glass lathe operation, a mixture of natural Gas, hydrogen and oxygen is used to weld a Pyrex glass radio transmitter tube to a copper anode ring.

RCA welds glass to metal at over 2000° F. ...thanks to GAS

Natural Gas is used to weld glass to metal in the production of radio and television tubes of many types at the RCA Tube Division plant in Lancaster, Pennsylvania.

To effect the weld at over 2000° F., a mixture of natural Gas, hydrogen and oxygen maintains the high welding temperature on the Pyrex glass and metal parts as they rotate on a glass lathe. A Gas flame is then used to control and equalize the cooling of the glass down to the 900-600° F. range.

For information on how Gas can help you in your production operations, call your Gas Company's industrial specialist. He'll be glad to discuss the economies and superior results you get with Gas and modern Gas-fired industrial equipment. *American Gas Association.*

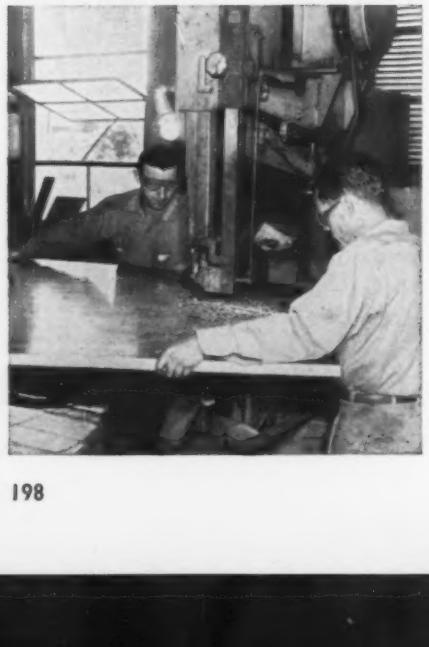
•

See Playhouse 90 with Julia Meade on CBS-TV. Watch local listings for time and station. Sponsored by your Gas Company and the Gas Industry.

In-Stock Service

on Carpenter Stainless No. 20 and No. 20Cb

forms, sizes and shapes for most corrosion problems



• Besides keeping our warehouses fully stocked with all forms of Carpenter Stainless No. 20 and 20Cb, we maintain fast, modern facilities to make up and speed your orders to you . . . no matter what your deadline. *Our service teams are geared to handle your most urgent delivery needs.*

Available from stock in sheet, plate, pipe, tubing, strip, bars, wire and billets, Carpenter Stainless No. 20 and 20Cb are as easily fabricated as ordinary stainless steels. You get long-life control of sulphuric acid and other severe corrodents in a hurry when you order Stainless No. 20 and 20Cb. One installation of this Super-Stainless will outlast most other corrosion-resistant alloys . . . economically. Contact our nearest office or authorized distributor (located in over 40 cities, coast to coast). Write on your company letterhead for technical bulletin 108A. The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

your master key to cost-saving corrosion control

Stainless No. 20 & 20Cb

Carpenter Stainless No. 20 bars, strip, wire and billets are available also from The Carpenter Steel Company, Reading, Pa.

IRON AGE

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BILLETS, BLOOMS, SLABS			PILING	SHAPES STRUCTURALS			STRIP					
		Carbon Rerolling Net Ton	Carbon Forging Net Ton	Alloy Net Ton	Sheet Steel	Carbon	Hi Str. Low Alloy	Carbon Wide-Flange	Hot-rolled	Cold-rolled	Hi Str. H.R. Low Alloy	Hi Str. C.R. Low Alloy	Alloy Hot-rolled	Alloy Cold-rolled
EAST	Bethlehem, Pa.			$119.00 *B3*		5.55 *B3*	8.10 *B3*	5.55 *B5*						
	Buffalo, N. Y.	$80.00 *R3, B3*	$99.50 *R3, B3*	$119.00 *R3, B3*	6.50 *B3*	5.55 *B3*	8.10 *B3*	5.55 *B3*	5.10 *B3, R3*	7.425 *S10, R7*	7.575 *B3*			
	Phila., Pa.									7.875 *P15*				
	Harrison, N. J.													15.55 *C11*
	Conshohocken, Pa.		$104.50 *A2*	$126.00 *A2*					5.15 *A2*		7.575 *A2*			
	New Bedford, Mass.									7.875 *R6*				
	Johnstown, Pa.	$80.00 *B3*	$99.50 *B3*	$119.00 *B3*		5.55 *B3*	8.10 *B3*							
	Boston, Mass.									7.975 *T8*				
	New Haven, Conn.									7.875 *D1*				
	Baltimore, Md.									7.425 *T8*				15.90 *T8*
	Phoenixville, Pa.					5.55 *P2*		5.55 *P2*						
	Sparrows Pt., Md.								5.10 *B3*		7.575 *B3*			
	New Britain, Bridgeport, Wallingford, Conn.			$119.00 *N8*						7.875 *W1,S7*				
	Pawtucket, R. I. Worcester, Mass.									7.975 *N7, A5*				15.90 *N7* 15.70 *T8*
MIDDLE WEST	Alton, Ill.								5.30 *L1*					
	Ashland, Ky.								5.10 *A7*		7.575 *A7*			
	Canton-Massillon, Dover, Ohio		$102.00 *R3*	$119.00 *R3,* $114.00 *T5*						7.425 *G4*		10.80 *G4*		
	Chicago, Franklin Park, Evanston, Ill.	$80.00 *U1, R3*	$99.50 *U1, R3,W8*	$119.00 *U1, R3,W8*	6.50 *U1*	5.50 *U1, W8,P13*	8.05 *U1, Y1,W8*	5.50 *U1*	5.10 *W8, N4,A1*	7.525 *A1,T8, M8*	7.575 *W8*		8.40 *W8, S9,I3*	15.55 *A1, S9,G4,T8*
	Cleveland, Ohio									7.425 *A5,J3*		10.75 *A5*	8.40 *J3*	
	Detroit, Mich.			$119.00 *R5*					5.10 *G3, M2*	7.425 *M2, S1, D1,P11*	7.575 *G3*	10.80 *S1*		
	Anderson, Ind.									7.425 *G4*				
	Gary, Ind. Harbor, Indiana	$80.00 *U1*	$99.50 *U1*	$119.00 *U1, Y1*		5.50 *U1, I3*	8.05 *U1, J3*	5.50 *I3*	5.10 *U1, I3,Y1*	7.425 *Y1*	7.575 *U1, I3,Y1*	10.90 *Y1*	8.40 *U1, Y1*	
	Sterling, Ill.	$80.00 *N4*				5.50 *N4*	7.75 *N4*	5.50 *N4*	5.20 *N4*					
	Indianapolis, Ind.									7.575 *R5*				15.70 *R5*
	Newport, Ky.								5.10 *A9*				8.40 *A9*	
	Niles, Warren, Ohio Sharon, Pa.		$99.50 *S1, C10*	$119.00 *C10,S1*					5.10 *R3, S1*	7.425 *R3, T4,S1*	7.575 *R3, S1*	10.80 *R3, S1*	8.40 *S1*	15.55 *S1*
	Owensboro, Ky.	$80.00 *G5*	$99.50 *G5*	$119.00 *G5*										
	Pittsburgh, Midland, Butler, Aliquippa, McKeesport, Pa.	$80.00 *U1, P6*	$99.50 *U1, C11,P6*	$119.00 *U1, C11,B7*	6.50 *U1*	5.50 *U1, J3*	8.05 *U1, J3*	5.50 *U1*	5.10 *P6*	7.425 *J3,B4* 7.525 *E3*			8.40 *S9*	15.55 *S9*
	Weirton, Wheeling, Follansbee, W. Va.				6.50 *U1, W3*	5.50 *W3*		5.50 *W3*	5.10 *W3*	7.425 *F3*	7.575 *W3*	10.80 *W3*		
	Youngstown, Ohio	$80.00 *R3*	$99.50 *Y1, C10*	$119.00 *Y1*			8.05 *Y1*		5.10 *U*	7.425 *Y1,R5*	7.575 *U1, Y1*	10.95 *Y1*	8.40 *U1, Y1*	15.55 *R5, Y1*
WEST	Fontana, Cal.	$90.50 *K1*	$109.00 *K1*	$140.00 *K1*		6.30 *K1*	8.85 *K1*	6.45 *K1*	5.825 *K1*	9.20 *K1*				
	Geneva, Utah		$99.50 *C7*			5.50 *C7*	8.05 *C7*							
	Kansas City, Mo.					5.60 *S2*	8.15 *S2*						8.65 *S2*	
	Los Angeles, Torrance, Cal.		$109.00 *B2*	$139.00 *B2*		6.20 *C7, B2*	8.75 *B2*		5.85 *C7, B2*	9.30 *C1,R5*			9.60 *B2*	17.75 *J3*
	Minnequa, Colo.					5.80 *C6*			6.20 *C6*	9.375 *C6*				
	Portland, Ore.					6.25 *O2*								
	San Francisco, Niles, Pittsburg, Cal.		$109.00 *B2*			6.15 *B2*	8.70 *B2*		5.85 *C7, B2*					
	Seattle, Wash.		$109.00 *B2*			6.25 *B2*	8.80 *B2*		6.10 *B2*					
SOUTH	Atlanta, Ga.					5.70 *A8*			5.10 *A8*					
	Fairfield, Ala. City, Birmingham, Ala.	$80.00 *T2*	$99.50 *T2*			5.50 *T2 R3,C16*	8.05 *T2*		5.10 *T2, R3,C16*		7.575 *T2*			
	Houston, Lone Star, Texas		$104.50 *S2*	$124.00 *S2*		5.60 *S2*	8.15 *S2*						8.65 *S2*	

(Effective May 18, 1959)

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		SHEETS								WIRE ROD	TINPLATE†		
		Hot-rolled *18* ga. & hvyr.	Cold-rolled	Galvanized (Hot-dipped)	Enameling	Long Terne	Hi Str. Low Alloy H.R.	Hi Str. Low Alloy C.R.	Hi Str. Low Alloy Galv.		Cokes* *1.25*-lb. base box	Electro** *0.25*-lb. base box	Holloware Enameling *29* ga.
EAST	Buffalo, N. Y.	5.10 *B3*	6.275 *B3*				7.525 *B3*	9.275 *B3*		6.40 *W6*	† Special coated mfg. terne deduct 35¢ from 1.25-lb. coke base box price, 0.75 lb./0.25 lb. add 55¢. Can-making quality BLACKPLATE 55 to 128 lb. deduct $2.20 from 1.25 lb. coke base box. * COKES: 1.50-lb. add 25¢. **ELECTRO: 0.50-lb. add 25¢; 0.75-lb. add 65¢; 1.00-lb. add $1.00. Differential 1.00 lb./0.25 lb. add 65¢.		
	Claymont, Del.												
	Coatesville, Pa.												
	Conshohocken, Pa.	5.15 *A2*	6.325 *A2*				7.575 *A2*						
	Harrisburg, Pa.												
	Hartford, Conn.												
	Johnstown, Pa.									6.40 *B3*			
	Fairless, Pa.	5.15 *U1*	6.325 *U1*				7.575 *U1*	9.325 *U1*			$10.50 *U1*	$9.20 *U1*	
	New Haven, Conn.												
	Phoenixville, Pa.												
	Sparrows Pt., Md.	5.10 *B3*	6.275 *B3*	6.875 *B3*			7.525 *B3*	9.275 *B3*	10.025 *B3*	6.50 *B3*	$10.40 *B3*	$9.10 *B3*	
	Worcester, Mass.									6.70 *A5*			
	Trenton, N. J.												
MIDDLE WEST	Alton, Ill.									6.60 *L1*			
	Ashland, Ky.	5.10 *A7*		6.875 *A7*	6.775 *A7*		7.525 *A7*						
	Canton-Massillon, Dover, Ohio			6.875 *R1, R3*									
	Chicago, Joliet, Ill.	5.10 *W8, A1*					7.525 *U1, W8*			6.40 *A5, R3,W8*			
	Sterling, Ill.									6.50 *N4, K2*			
	Cleveland, Ohio	5.10 *R3, J3*	6.275 *R3, J3*	7.65 *R3**	6.775 *R3*		7.525 *R3, J3*	9.275 *R3, J3*		6.40 *A5*			
	Detroit, Mich.	5.10 *G3, M2*	6.275 *G3, M2*				7.525 *G3*	9.275 *G3*					
	Newport, Ky.	5.10 *A1*	6.275 *A1*										
	Gary, Ind. Harbor, Indiana	5.10 *U1, I3,Y1*	6.275 *U1, I3,Y1*	6.875 *U1, I3*	6.775 *U1, I3,Y1*	7.225 *U1*	7.525 *U1, Y1,I3*	9.275 *U1, Y1*		6.40 *Y1*	$10.40 *U1, Y1*	$9.10 *I3, U1,Y1*	7.85 *U1, Y1*
	Granite City, Ill.	5.20 *G2*	6.375 *G2*	6.975 *G2*	6.875 *G2*							$9.20 *G2*	7.95 *G2*
	Kokomo, Ind.			6.975 *C9*						6.50 *C9*			
	Mansfield, Ohio	5.10 *E2*	6.275 *E2*			7.225 *E2*							
	Middletown, Ohio		6.275 *A7*	6.875 *A7*	6.775 *A7*	7.225 *A7*							
	Niles, Warren, Ohio Sharon, Pa.	5.10 *R3, S1*	6.275 *R3*	6.875 *R3* 7.65 *R3**	6.775 *S1*	7.225 *S1*, *R3*	7.525 *R3, S1*	9.275 *R3,*				$9.10 *R3*	
	Pittsburgh, Midland, Butler, Donora, Aliquippa, McKeesport, Pa.	5.10 *U1, J3,P6*	6.275 *U1, J3,P6*	6.875 *U1, J3* 7.50 *E3**	6.775 *U1*		7.525 *U1, J3*	9.275 *U1, J3*	10.025 *U1, J3*	6.40 *A5, J3,P6*	$10.40 *W5, J3*	$9.10 *U1, J3*	7.85 *U1, J3*
	Portsmouth, Ohio	5.10 *P7*	6.275 *P7*							6.40 *P7*			
	Weirton, Wheeling, Follansbee, W. Va.	5.10 *W3, W5*	6.275 *W3, F3,W5*	6.875 *W3, W5* 7.50 *W3**		7.225 *W3, W5*	7.525 *W3*	9.275 *W3*			$10.40 *W5, W3*	$9.10 *W5, W3*	7.85 *W5*
	Youngstown, Ohio	5.10 *U1, Y1*	6.275 *Y1*	7.50 *J3**	6.775 *Y1*		7.525 *Y1*	9.275 *Y1*		6.40 *Y1*			
WEST	Fontana, Cal.	5.825 *K1*	7.40 *K1*				8.25 *K1*	10.40 *K1*			$11.05 *K1*	$9.75 *K1*	
	Geneva, Utah	5.20 *C7*											
	Kansas City, Mo.									6.65 *S2*			
	Los Angeles, Torrance, Cal.									7.20 *B2*			
	Minnequa, Colo.									6.65 *C6*			
	San Francisco, Niles, Pittsburg, Cal.	5.80 *C7*	7.225 *C7*	7.625 *C7*						7.20 *C7*	$11.05 *C7*	$9.75 *C7*	
SOUTH	Atlanta, Ga.												
	Fairfield, Ala. Alabama City, Ala.	5.10 *T2, R3*	6.275 *T2, R3*	6.875 *T2, R3*	6.775 *T2*					6.40 *T2,R3*	$10.50 *T2*	$9.20 *T2*	
	Houston, Texas									6.65 *S2*			

* Electrogalvanized sheets.

(Effective May 18, 1959)

**7.425 at Sharon-Niles is 7.225

STEEL PRICES

Italics identify producers listed in key at end of table. Base prices, f.o.b. mill, in cents per lb., unless otherwise noted. Extras apply.

		BARS						PLATES				WIRE
		Carbon† Steel	Reinforcing	Cold Finished	Alloy Hot-rolled	Alloy Cold Drawn	Hi Str. H.R. Low Alloy	Carbon Steel	Floor Plate	Alloy	Hi Str. Low Alloy	Mfr's. Bright
EAST	Bethlehem, Pa.				6.725 *B3*	9.025 *B3*	8.30 *B3*					
	Buffalo, N. Y.	5.675 *R3,B3*	5.675 *R3,B3*	7.70 *B5*	6.725 *B3,R3*	9.025 *B3,B5*	8.30 *B3*	5.30 *B3*				8.00 *W6*
	Claymont, Del.							5.30 *C4*		7.50 *C4*	7.95 *C4*	
	Coatesville, Pa.							5.30 *L4*		7.50 *L4*	7.95 *L4*	
	Conshohocken, Pa.							5.30 *A2*	6.375 *A2*	7.50 *A2*	7.95 *A2*	
	Harrisburg, Pa.							5.30 *P2*	6.375 *P2*			
	Milton, Pa.	5.825 *M7*	5.825 *M7*									
	Hartford, Conn.			8.15 *R3*		9.325 *R3*						
	Johnstown, Pa.	5.675 *B3*	5.675 *B3*		6.725 *B3*		8.30 *B3*	5.30 *B3*		7.50 *B3*	7.95 *B3*	8.00 *B3*
	Fairless, Pa.	5.825 *U1*	5.825 *U1*		6.875 *U1*							
	Newark, Camden, N. J.			8.10 *W10, P10*		9.20 *W10, P10*						
	Bridgeport, Putnam, Willimantic, Conn.			8.20 *W10* 8.15 *J3*	6.80 *N8*	9.175 *N8*						
	Sparrows Pt., Md.		5.675 *B3*					5.30 *B3*		7.50 *B3*	7.95 *B3*	8.10 *B3*
	Palmer, Worcester, Readville, Mansfield, Mass.			8.20 *B5, C14*		9.325 *A5,B5*						8.30 *A5, W6*
	Spring City, Pa.			8.10 *K4*		9.20 *K4*						
MIDDLE WEST	Alton, Ill.	5.875 *L1*										8.20 *L1*
	Ashland, Newport, Ky.							5.30 *A7,A9*		7.50 *A9*	7.95 *A7*	
	Canton, Massillon, Mansfield, Ohio	6.15* *R3*		7.65 *R3,R2*	6.725 *R3* 6.475 *T5*	9.025 *R3,R2* 8.775 *T5*		5.30 *E2*				
	Chicago, Joliet, Waukegan, Madison, Harvey, Ill.	5.675 *U1,R3, W8,N4,P13*	5.675 *U1,R3, N4,P13,W8* 5.875*L1*	7.65 *A5, W10,W8, B5,L2,N9*	6.725 *U1,R3, W8*	9.025 *A5, W10,W8, L2,N8,B5*	8.30 *U1,W8, R3*	5.30 *U1,A1, W8,I3*	6.375 *U1*	7.50 *U1, W8*	7.95 *U1, W8*	8.00 *A5,R3, W8,N4, K2,W7*
	Cleveland, Elyria, Ohio	5.675 *R3*	5.675 *R3*	7.65 *A5,C13, C18*		9.025 *A5, C13,C18*	8.30 *R3*	5.30 *R3,J3*	6.375 *J3*		7.95 *R3,J3*	8.00 *A5, C13,C18*
	Detroit, Mich.	5.675 *G3*	5.675 *G3*	7.90 *P3* 7.85 *P8,B5* 7.65 *R5*	6.725 *R5,G3*	9.025 *R5* 9.225 *B5,P3, P8*	8.30 *G3*	5.30 *G3*		7.50 *G3*	7.95 *G3*	
	Duluth, Minn.											8.00 *A5*
	Gary, Ind. Harbor, Crawfordsville, Hammond, Ind.	5.675 *U1,I3, Y1*	5.675 *U1,I3, Y1*	7.65 *R3,J3*	6.725 *U1,I3, Y1*	9.025 *R3,M4*	8.30 *U1,Y1*	5.30 *U1,I3, Y1*	6.375 *J3, I1*	7.50 *U1, Y1*	7.95 *U1, Y1,I3*	8.10 *M4*
	Granite City, Ill.							5.40 *G2*				
	Kokomo, Ind.		5.775 *C9*									8.10 *C9*
	Sterling, Ill.	5.775 *N4*	5.775 *N4*					5.30 *N4*				8.10 *K2*
	Niles, Warren, Ohio Sharon, Pa.			7.65 *C10*	6.725 *C10,*	9.025 *C10*		5.30 *R3,S1*		7.50 *S1*	7.95 *R3, S1*	
	Owensboro, Ky.	5.675 *G5*			6.725 *G5*							
	Pittsburgh, Midland, Donora, Aliquippa, Pa.	5.675 *U1,J3*	5.675 *U1,J3*	7.65 *A5,B4, R3,J3,C11, W10,S9,C8, M9*	6.725 *U1,J3, C11,B7*	9.025 *A5, W10,R3,S9, C11,C8,M9*	8.30 *U1,J3*	5.30 *U1,J3*	6.375 *U1,J3*	7.50 *U1, J3,B7*	7.95 *U1, J3,B7*	8.00 *A5, J3,P6*
	Portsmouth, Ohio											8.00 *P7*
	Weirton, Wheeling, Follansbee, W. Va.							5.30 *W5*				
	Youngstown, Ohio	5.675 *U1,R3, Y1*	5.675 *U1,R3, Y1*	7.65 *A1,Y1, F2*	6.725 *U1,Y1*	9.025 *Y1,F2*	8.30 *U1,Y1*	5.30 *U1, R3,Y1*		7.50 *Y1*	7.95 *U1,Y1*	8.00 *Y1*
WEST	Emeryville, Fontana, Cal.	6.425 *J5* 6.375 *K1*	6.425 *J5* 6.375 *K1*		7.775 *K1*		9.00 *K1*	6.10 *K1*		8.30 *K1*	8.75 *K1*	
	Geneva, Utah							5.30 *C7*			7.95 *C7*	
	Kansas City, Mo.	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*					8.25 *S2*
	Los Angeles, Torrance, Cal.	6.375 *C7,B2*	6.375 *C7,B2*	9.10 *R3,P14, S12*	7.775 *B2*	11.00 *P14, S12*	8.625 *B2*					8.95 *B2*
	Minnequa, Colo.	6.125 *C6*	6.125 *C6*					6.15 *C6*				8.25 *C6*
	Portland, Ore.	6.425 *O2*	6.425 *O2*									
	San Francisco, Niles, Pittsburg, Cal.	6.375 *C7* 6.425 *B2*	6.375 *C7* 6.425 *B2*				8.675 *B2*					8.95 *C7,C6*
	Seattle, Wash.	6.425 *B2,N6, A10*	6.425 *B2,A10*				8.675 *B2*	6.20 *B2*		8.40 *B2*	8.85 *B2*	
SOUTH	Atlanta, Ga.	5.875 *A8*	5.675 *A8*									8.00 *A8*
	Fairfield City, Ala. Birmingham, Ala.	5.675 *T2,R3, C16*	5.675 *T2,R3, C16*	8.25 *C16*			8.30 *T2*	5.30 *T2,R3*			7.95 *T2*	8.00 *T2,R3*
	Houston, Ft. Worth, Lone Star, Texas	5.925 *S2*	5.925 *S2*		6.975 *S2*		8.55 *S2*	5.40 *S2*		7.60 *S2*	8.05 *S2*	8.25 *S2*

† Merchant Quality—Special Quality 35¢ higher. (Effective May 18, 1959) * Special Quality.

STEEL PRICES

Key to Steel Producers

With Principal Offices

A1 Acme Steel Co., Chicago
A2 Alan Wood Steel Co., Conshohocken, Pa.
A3 Allegheny Ludlum Steel Corp., Pittsburgh
A4 American Cladmetals Co., Carnegie, Pa.
A5 American Steel & Wire Div., Cleveland
A6 Angel Nail & Chaplet Co., Cleveland
A7 Armco Steel Corp., Middletown, Ohio
A8 Atlantic Steel Co., Atlanta, Ga.
A9 Acme-Newport Steel Co., Newport, Ky.
A10 Alaska Steel Mills, Inc., Seattle, Wash.

B1 Babcock & Wilcox Tube Div., Beaver Falls, Pa.
B2 Bethlehem Pacific Coast Steel Corp., San Francisco
B3 Bethlehem Steel Co., Bethlehem, Pa.
B4 Blair Strip Steel Co., New Castle, Pa.
B5 Bliss & Laughlin, Inc., Harvey, Ill.
B6 Brook Plant, Wickwire-Spencer Steel Div., Birdsboro, Pa.
B7 A. M. Byers, Pittsburgh
B8 Braeburn Alloy Steel Corp., Braeburn, Pa.

C1 Calstrip Steel Corp., Los Angeles
C2 Carpenter Steel Co., Reading, Pa.
C4 Claymont Products Dept., Claymont, Del.
C6 Colorado Fuel & Iron Corp., Denver
C7 Columbia Geneva Steel Div., San Francisco
C8 Columbia Steel & Shafting Co., Pittsburgh
C9 Continental Steel Corp., Kokomo, Ind.
C10 Copperweld Steel Co., Pittsburgh, Pa.
C11 Crucible Steel Co. of America, Pittsburgh
C13 Cuyahoga Steel & Wire Co., Cleveland
C14 Compressed Steel Shafting Co., Readville, Mass.
C15 G. O. Carlson, Inc., Thorndale, Pa.
C16 Connors Steel Div., Birmingham
C18 Cold Drawn Steel Plant, Western Automatic Machine Screw Co., Elyria, O.

D1 Detroit Steel Corp., Detroit
D2 Driver, Wilbur B.. Co., Newark, N. J.
D3 Driver Harris Co., Harrison, N. J.
D4 Dickson Weatherproof Nail Co., Evanston, Ill.

E1 Eastern Stainless Steel Corp., Baltimore
E2 Empire-Reeves Steel Corp., Mansfield, O.
E3 Enamel Products & Plating Co., McKeesport, Pa.

F1 Firth Sterling, Inc., McKeesport, Pa.
F2 Fitzsimons Steel Corp., Youngstown
F3 Follansbee Steel Corp., Follansbee, W. Va.

G2 Granite City Steel Co., Granite City, Ill.
G3 Great Lakes Steel Corp., Detroit
G4 Greer Steel Co., Dover, O.
G5 Green River Steel Corp., Owenboro, Ky.

H1 Hanna Furnace Corp., Detroit

I2 Ingersoll Steel Div., Chicago
I3 Inland Steel Co., Chicago
I4 Interlake Iron Corp., Cleveland

J1 Jackson Iron & Steel Co., Jackson, O.
J2 Jessop Steel Corp., Washington, Pa.
J3 Jones & Laughlin Steel Corp., Pittsburgh
J4 Joslyn Mfg. & Supply Co., Chicago
J5 Judson Steel Corp., Emeryville, Calif.

K1 Kaiser Steel Corp., Fontana, Calif.
K2 Keystone Steel & Wire Co., Peoria
K3 Koppers Co., Granite City, Ill.
K4 Keystone Drawn Steel Co., Spring City, Pa.

L1 Laclede Steel Co., St. Louis
L2 La Salle Steel Co., Chicago
L3 Lone Star Steel Co., Dallas
L4 Lukens Steel Co., Coatesville, Pa.

M1 Mahoning Valley Steel Co., Niles, O.
M2 McLouth Steel Corp., Detroit
M3 Mercer Tube & Mfg. Co., Sharon, Pa.
M4 Mid States Steel & Wire Co., Crawfordsville, Ind.
M6 Mystic Iron Works, Everett, Mass.
M7 Milton Steel Products Div., Milton, Pa.
M8 Mill Strip Products Co., Evanston, Ill.
M9 Moltrup Steel Products Co., Beaver Falls, Pa.

N1 National Supply Co., Pittsburgh
N2 National Tube Div., Pittsburgh
N4 Northwestern Steel & Wire Co., Sterling, Ill.
N6 Northwest Steel Rolling Mills, Seattle
N7 Newman Crosby Steel Co., Pawtucket, R. I.
N8 Carpenter Steel of New England, Inc., Bridgeport, Conn.
N9 Nelson Steel & Wire Co.

O1 Oliver Iron & Steel Co., Pittsburgh
O2 Oregon Steel Mills, Portland

P1 Page Steel & Wire Div., Monessen, Pa.
P2 Phoenix Steel Corp., Phoenixville, Pa.
P3 Pilgrim Drawn Steel Div., Plymouth, Mich.
P4 Pittsburgh Coke & Chemical Co., Pittsburgh
P5 Pittsburgh Screw & Bolt Co., Pittsburgh
P6 Pittsburgh Steel Co., Pittsburgh
P7 Portsmouth Div., Detroit Steel Corp., Detroit
P8 Plymouth Steel Co., Detroit
P9 Pacific States Steel Co., Niles, Cal.
P10 Precision Drawn Steel Co., Camden, N. J.
P11 Production Steel Strip Corp., Detroit
P13 Phoenix Mfg. Co., Joliet, Ill.
P14 Pacific Tube Co.
P15 Philadelphia Steel and Wire Corp.

R1 Reeves Steel & Mfg. Div., Dover, O.
R2 Reliance Div., Eaton Mfg. Co., Massillon, O.
R3 Republic Steel Corp., Cleveland
R4 Roebling Sons Co., John A., Trenton, N. J.
R5 Jones & Laughlin Steel Corp., Stainless and Strip Div.
R6 Rodney Metals, Inc., New Bedford, Mass.
R7 Rome Strip Steel Co., Rome, N. Y.

S1 Sharon Steel Corp., Sharon Pa.
S2 Sheffield Steel Div., Kansas City
S3 Shenango Furnace Co., Pittsburgh
S4 Simonds Saw and Steel Co., Fitchburg, Mass.
S5 Sweet's Steel Co., Williamsport, Pa.
S7 Stanley Works, New Britain, Conn.
S8 Superior Drawn Steel Co., Monaca, Pa.
S9 Superior Steel Div. of Copperweld Steel Co., Carnegie, Pa.
S10 Seneca Steel Service, Buffalo
S11 Southern Electric Steel Co., Birmingham
S12 Sierra Drawn Steel Corp., Los Angeles, Calif.
S13 Seymour Mfg. Co., Seymour, Conn.

T1 Tonawanda Iron Div., N. Tonawanda, N. Y.
T2 Tennessee Coal & Iron Div., Fairfield
T3 Tennessee Products & Chem. Corp., Nashville
T4 Thomas Strip Div., Warren, O.
T5 Timken Steel & Tube Div., Canton, O.
T7 Texas Steel Co., Fort Worth
T8 Thompson Wire Co., Boston

U1 United States Steel Corp., Pittsburgh
U2 Universal-Cyclops Steel Corp., Bridgeville, Pa.
U3 Ulbrich Stainless Steels, Wallingford, Conn.
U4 U. S. Pipe & Foundry Co., Birmingham

W1 Wallingford Steel Co., Wallingford, Conn.
W2 Washington Steel Corp., Washington, Pa.
W3 Weirton Steel Co., Weirton, W. Va.
W4 Wheatland Tube Co., Wheatland, Pa.
W5 Wheeling Steel Corp., Wheeling, W. Va.
W6 Wickwire Spencer Steel Div., Buffalo
W7 Wilson Steel & Wire Co., Chicago.
W8 Wisconsin Steel Div., S. Chicago, Ill.
W9 Woodward Iron Co., Woodward, Ala.
W10 Wyckoff Steel Co., Pittsburgh
W12 Wallace Barnes Steel Div., Bristol, Conn.

Y1 Youngstown Sheet & Tube Co., Youngstown, O.

PIPE AND TUBING

Base discounts (pct) f.o.b. mills. Base price about $200 per net ton.

	BUTTWELD														SEAMLESS							
	½ In.		¾ In.		1 In.		1¼ In.		1½ In.		2 In.		2½–3 In.		2 In.		2½ In.		3 In.		3½–4 In.	
STANDARD T. & C.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
Sparrows Pt. *B3*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Youngstown *R3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fontana *K1*	+10.75	+26.00	+7.75	+22.00	+4.25	+17.50	+1.75	+16.75	+1.25	+15.75	+0.75	+15.25	0.75	+15.50								
Pittsburgh *J3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Alton, Ill. *L1*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Sharon *M3*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Fairless *N2*	0.25	+15.0	3.25	+11.0	6.75	+6.50	9.25	+5.75	9.75	+4.75	10.25	+4.25	11.75	+4.50								
Pittsburgh *N1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+7.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Wheeling *W5*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Wheatland *W4*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50								
Youngstown *Y1*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
Indiana Harbor *Y1*	1.25	+14.0	4.25	+10.0	7.75	+5.50	10.25	+4.75	10.75	+3.75	11.25	+3.25	12.75	+3.50								
Lorain *N2*	2.25	+13.0	5.25	+9.0	8.75	+4.50	11.25	+3.75	11.75	+2.75	12.25	+2.25	13.75	+2.50	+12.25	+27.25	+5.75	+22.50	+3.25	+20.0	+1.75	+18.50
EXTRA STRONG PLAIN ENDS																						
Sparrows Pt. *B3*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Youngstown *R3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Fairless *N2*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Fontana *K1*	+6.25		+2.25		0.75		1.25		1.75		2.25		2.75									
Pittsburgh *J3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Alton, Ill. *L1*	4.75	+9.0	8.75	+5.0	11.75	+0.50	12.25	+1.75	12.75	+0.75	13.25	+0.25	13.75	+1.50								
Sharon *M3*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Pittsburgh *N1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Wheeling *W5*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Wheatland *W4*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50								
Youngstown *Y1*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50
Indiana Harbor *Y1*	5.75	+8.0	9.75	+4.0	12.75	0.50	13.25	+0.75	13.75	0.25	14.25	0.75	14.75	+0.50								
Lorain *N2*	6.75	+7.0	10.75	+3.0	13.75	1.50	14.25	0.25	14.75	1.25	15.25	1.75	15.75	0.50	+10.75	+24.75	+3.25	+19.0	+0.75	+16.50	4.25	+11.50

Threads only, buttweld and seamless, 2¼ pt. higher discount. Plain ends, buttweld and seamless, 3-in. and under, 5½ pt. higher discount.
Galvanized discounts based on zinc price range of over 9¢ to 11¢ per lb. East St. Louis. For each 2¢ change in zinc, discounts vary as follows: ½, ¾ and 1-in., 2 pt.; 1¼, 1½ and 2-in., 1½ pt.; 2½ and 3-in., 1 pt., e.g., zinc price range of over 13¢ to 15¢ would lower discounts on 2½ and 3-in. pipe by 2 points; zinc price in range over 7¢ to 9¢ would increase discounts. East St. Louis zinc price now 11.00¢ per lb.

(Effective May 18, 1959)

TOOL STEEL

F.o.b. mill

W	Cr	V	Mo	Co	per lb	SAE
18	4	1	—	—	$1.84	T-1
18	4	1	—	5	2.545	T-4
18	4	2	—	—	2.005	T-2
1.5	4	1.5	8	—	1.20	M-1
6	4	3	6	—	1.59	M-3
6	4	2	5	—	1.345	M-2
High-carbon chromium..					.955	D-3, D-5
Oil hardened manganese					.505	O-2
Special carbon					.38	W-1
Extra carbon					.38	W-1
Regular carbon					.325	W-1

Warehouse prices on and east of Mississippi are 4¢ per lb higher. West of Mississippi, 6¢ higher.

CLAD STEEL

Base prices, cents per lb f.o.b.

	Cladding	Plate (*L4, C4, A3, J2*) 10 pct	Plate (*L4, C4, A3, J2*) 15 pct	Plate (*L4, C4, A3, J2*) 20 pct	Sheet (*I2*) 20 pct
Stainless Type	302	.....	.....	.....	37.50
	304	28.80	31.55	34.30	40.00
	316	42.20	46.25	50.25	58.75
	321	34.50	37.75	41.05	47.25
	347	40.80	44.65	48.55	57.00
	405	24.60	26.90	29.25	.....
	410	22.70	24.85	27.00	.....
	430	23.45	25.65	27.90	.....

CR Strip (S9) Copper, 10 pct, 2 sides, 43.15; 1 side, 36.20.

RAILS, TRACK SUPPLIES

F.o.b. Mill Cents Per Lb	No. 1 Std. Rails	Light Rails	Joint Bars	Track Spikes	Tie Plates	Track Bolts Untreated
Bessemer *Ul*	5.75	6.725	7.25	.....	.....	.....
Cleveland *R3*	.....	.....	.....	.....	.....	15.35
So. Chicago *R3*	.....	.....	.....	10.10	.....	.....
Ensley *T2*	5.75	6.725	.....	.....	.....	.....
Fairfield *T2*	.....	6.725	.....	10.10	6.875	.....
Gary *Ul*	5.75	.....	.....	.....	6.875	.....
Ind. Harbor *I3*	.....	.....	.....	10.10	.....	.....
Johnstown *B3*	.....	6.725	.....	.....	.....	.....
Joliet *Ul*	.....	.....	7.25	.....	.....	.....
Kansas City *S2*	.....	.....	.....	10.10	.....	15.35
Lackawanna *B3*	5.75	6.725	7.25	.....	6.875	.....
Lebanon *B3*	.....	.....	7.25	.....	.....	15.35
Minnequa *C6*	5.75	7.225	7.25	10.10	6.875	15.35
Pittsburgh *P5*	.....	.....	.....	.....	.....	14.75
Pittsburgh *J3*	.....	.....	.....	10.10	.....	.....
Seattle *B2*	.....	.....	.....	.....	6.75	15.85
Steelton *B3*	5.75	.....	7.25	.....	6.875	.....
Struthers *Yl*	.....	.....	.....	10.10	.....	.....
Torrance *C7*	.....	.....	.....	.....	6.75	.....
Williamsport *S5*	.....	6.725	.....	.....	.....	.....
Youngstown *R3*	.....	.....	.....	10.10	.....	.....

COKE

	Net-Ton
Furnace, beehive (f.o.b.) Connellsville, Pa.	$14.50 to $15.50
Foundry, beehive (f.o.b.)	$18.50
Foundry oven coke	
Buffalo, del'd	$33.25
Detroit f.o.b.	32.00
New England, del'd	33.55
New Haven, f.o.b.	31.00
Kearney, N. J., f.o.b.	31.25
Philadelphia, f.o.b.	31.00
Swedeland, Pa., f.o.b.	31.00
Painesville, Ohio, f.o.b.	34.35
Erie, Pa., f.o.b.	32.00
Cleveland, del'd	34.19
Cincinnati, del'd	32.84
St. Paul, f.o.b.	31.25
St. Louis, f.o.b.	33.00
Birmingham, f.o.b.	30.35
Milwaukee, f.o.b.	32.00
Neville Is., Pa.	30.75

LAKE SUPERIOR ORES

51.50% Fe natural, delivered lower Lake ports. Interim prices for 1959 season. Freight changes for seller's account.

	Gross Ton
Openhearth lump	$12.70
Old range, bessemer	11.85
Old range, nonbessemer	11.70
Mesabi, bessemer	11.60
Mesabi, nonbessemer	11.45
High phosphorus	11.45

ELECTRICAL SHEETS

22-Gage F.o.b. Mill Cents Per Lb	Hot-Rolled (Cut Lengths)*	Cold-Reduced (Coiled or Cut Length) Semi-Processed	Cold-Reduced (Coiled or Cut Length) Fully Processed
Field	.....	9.875	.....
Armature	11.70	11.20	11.70
Elect.	12.40	11.90	12.40
Special Motor	.....	12.475	.....
Motor	13.55	13.05	13.55
Dynamo	14.65	14.15	14.65
Trans. 72	15.70	15.20	15.70
Trans. 65	16.30		
		Grain Oriented	
Trans. 58	16.80	Trans. 80	19.70
Trans. 52	17.85	Trans. 73	20.20
		Trans. 66	20.70

Producing points: Aliquippa (*J3*); Beech Bottom (*W5*); Brackenridge (*A3*); Granite City (*G2*); Indiana Harbor (*I3*); Mansfield (*E2*); Newport, Ky. (*A9*); Niles, O. (*S1*); Vandergrift (*Ul*); Warren, O. (*R3*); Zanesville, Butler (*A7*).

ELECTRODES

Cents per lb. f.o.b. plant, threaded, with nipples, unboxed.

GRAPHITE Diam. (In.)	GRAPHITE Length (In.)	GRAPHITE Price	CARBON* Diam. (In.)	CARBON* Length (In.)	CARBON* Price
24	84	27.25	40	100,110	12.50
20	72	26.50	35	110	11.20
18	72	27.50	30	110	11.70
14	72	27.25	24	72	11.95
12	72	28.25	20	90	11.55
10	60	29.50	17	72	12.10
10	48	30.00	14	72	12.55
7	60	29.75	10	60	13.80
6	60	33.25	8	60	14.25
4	40	37.00			
3	40	39.25			
2½	30	41.50			
2	24	64.00			

* Prices shown cover carbon nipples.

REFRACTORIES

Fire Clay Brick

Carloads per 1000

Super duty, Mo., Pa., Md., Ky.	$185.00
High duty (except Salina, Pa., add $5.00)	140.00
Medium duty	125.00
Low duty (except Salina, Pa., add $2.00)	103.00
Ground fire clay, net ton, bulk	22.50

Silica Brick

Mt. Union, Pa., Ensley, Ala.	$158.00
Childs, Hays, Latrobe, Pa.	163.00
Chicago District	168.00
Western Utah	183.00
California	165.00
Super Duty Hays, Pa., Athens, Tex., Windham, Warren, O., Morrisville	163.00-168.00
Silica cement, net ton, bulk, Latrobe	29.75
Silica cement, net ton, bulk, Chicago	26.75
Silica cement, net ton, bulk, Ensley, Ala.	27.75
Silica cement, net ton, bulk, Mt. Union	25.75
Silica cement, net ton, bulk, Utah and Calif.	39.00

Chrome Brick

Per net ton

Standard chemically bonded, Balt.	$109.00
Standard chemically bonded, Curtiner, Calif.	119.00
Burned, Balt.	103.00

Magnesite Brick

Standard, Baltimore	$140.00
Chemically bonded, Baltimore	119.00

Grain Magnesite

St. ⅜ to ½-in. grains

Domestic, f.o.b. Baltimore in bulk.	$73.00
Domestic, f.o.b. Chewalah, Wash., Luning, Nev. in bulk	46.00
in sacks	52.00-54.00

Dead Burned Dolomite

Per net ton

F.o.b. bulk, producing points in: Pa., W. Va., Ohio	$16.75
Missouri Valley	15.60
Midwest	17.00

(Effective May 18, 1959)

MERCHANT WIRE PRODUCTS

F.o.b. Mill	Standard Q Coated Nails Col	Woven Wire Fence Col	"T" Fence Posts Col	Single Loop Bale Ties Col	Galv. Barbed and Twisted Barbless Wire Col	Merch. Wire Ann'ld ¢/lb.	Merch. Wire Galv. ¢/lb.
Alabama City *R3*	173	187	...	212	193	9.00	9.55
Aliquippa *J3***	173	190	...	...	190	9.00	9.675
Atlanta *A8***	175	192	...	214	198	8.75	9.425
Bartonville *K2***	175	192	178	214	198	9.10	9.775
Buffalo *W6*	.....	.....	.....	.....	.....	9.00	9.55*
Chicago *N4***	177	190	172	212	196	9.00	9.70
Chicago *R3*	.....	.....	.....	.....	.....	9.00	9.55
Cleveland *A6*	.....	.....	.....	.....	.....	.....	.....
Cleveland *A5*	.....	.....	.....	.....	.....	9.00	.....
Crawf'dav. *M4***	175	192	...	214	198	9.10	9.775
Donora, Pa. *A5*	173	187	...	212	193	9.00	9.55
Duluth *A5*	173	187	...	212	193	9.00	9.55
Fairfield, Ala. *T2*	173	187	...	212	193	9.00	9.55
Galveston *D4*	9.10‡	.....	.....	.....	.....	.....	.....
Houston *S2*	178	192	...	217	198	9.25	9.80†
Jacksonville *M4*	184-1	197	...	219	203	9.10	9.775
Johnstown *B3***	173	190	17.	...	196	9.00	9.675
Joliet, Ill. *A5*	173	187	...	212	193	9.00	9.55
Kokomo *C9*	175	189	...	214	195*	9.10	9.65*
L. Angeles *B2****	.....	.....	.....	.....	.....	9.95	10.625
Kansas City *S2**	178	192	...	217	198*	9.25	9.80†
Minnequa *C6*	178	192	182	217	198†	9.25	9.80†
Monessen *P6*	.....	.....	.....	.....	193	8.65	9.325
Palmer, Mass. *W6*	.....	.....	.....	.....	.....	9.30	9.85*
Pittsburg, Cal. *C7*	192	210	...	...	213	9.60	10.15
Rankin, Pa. *A5*	173	187	...	...	193	9.00	9.55
So. Chicago *R3*	173	187	...	...	193	8.65	9.20
S. San Fran. *C6*	.....	.....	.....	236	.....	9.95	10.50†
SparrowsPt. *B3***	175	.....	.....	214	198	9.10	9.775
Struthers, O. *Yl**	.....	.....	.....	.....	.....	8.65	9.20
Worcester *A5*	179	.....	.....	.....	.....	9.30	9.85
Williamsport *S5*	.....	.....	.....	.....	.....	.....	.....

* Zinc less than .10¢. *** .10¢ zinc.
** 11-12¢ zinc. † Plus zinc extras.
‡ Wholesalers only.

C-R SPRING STEEL

Cents Per Lb F.o.b. Mill	CARBON CONTENT 0.26-0.40	0.41-0.60	0.61-0.80	0.81-1.05	1.06-1.35
Anderson, Ind. *G4*	8.95	10.40	12.60	15.60	18.55
Baltimore, Md. *T8*	9.50	10.70	12.90	15.90	18.85
Bristol, Conn. *W12*	.....	10.70	12.90	16.10	19.30
Boston *T8*	9.50	10.70	12.90	15.90	18.85
Buffalo, N. Y. *R7*	8.95	10.40	12.60	15.60	18.55
Carnegie, Pa. *S9*	8.95	10.40	12.60	15.60	18.55
Cleveland *A5*	8.95	10.40	12.60	15.60	18.55
Dearborn *S1*	9.05	10.50	12.70	.....	.....
Detroit *D1*	9.05	10.50	12.70	15.70	.....
Detroit *D2*	9.05	10.50	12.70	.....	.....
Dover, O. *G4*	8.95	10.40	12.60	15.60	18.55
Evanston, Ill. *M8*	9.05	10.40	12.60	.....	.....
Franklin Park, Ill. *T8*	9.05	10.40	12.60	15.60	18.55
Harrison, N. J. *C11*	.....	.....	12.90	16.10	19.30
Indianapolis *R5*	9.10	10.55	12.60	15.60	18.55
Los Angeles *C1*	11.15	12.60	14.80	17.80	.....
New Britain, Conn. *S7*	9.40	10.70	12.90	15.90	18.85
New Castle, Pa. *B4*	8.95	10.40	12.60	15.60	.....
New Haven, Conn. *D1*	9.40	10.70	12.90	15.90	.....
Pawtucket, R. I. *N7*	9.50	10.70	12.90	15.90	18.85
Riverdale, Ill. *A1*	9.05	10.40	12.60	15.60	18.55
Sharon, Pa. *S1*	8.95	10.40	12.60	15.60	18.55
Trenton, *R4*	.....	10.70	12.90	16.10	19.30
Wallingford *W1*	9.40	10.70	12.90	15.90	18.55
Warren, Ohio *T4*	8.95	10.40	12.60	15.60	18.75
Worcester, Mass. *A5*	9.50	10.70	12.90	15.90	18.85
Youngstown *R5*	9.10	10.55	12.60	15.60	18.55

BOILER TUBES

$ per 100 ft. carload lots cut 10 to 24 ft. F.o.b. Mill	Size OD-In.	Size B.W. Ga.	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
Babcock & Wilcox..	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
National Tube.....	2	13	40.28	47.21	35.22
	2½	12	54.23	63.57	47.43
	3	12	62.62	73.40	54.77
	3½	11	73.11	85.70	63.93
	4	10	97.08	113.80	85.53
Pittsburgh Steel...	2	13	40.28	47.21	.....
	2½	12	54.23	63.57	.....
	3	12	62.62	73.40	.....
	3½	11	73.11	85.70	.....
	4	10	97.08	113.80	.....

METAL POWDERS

Cents per lb, minimum truckload, delivered E. of Miss. River, unless otherwise noted.

Iron Powders

Compacting Powders

Electrolytic, imported, f.o.b.	29.50 to 33.00
Electrolytic, domestic	34.50
Sponge	11.25
Atomized	11.25
Hydrogen Reduced	11.25 to 12.00
Carbonyl	88.00
Welding Powders*	8.10
Cutting and Scarfing Powders*	9.10

Copper Powders

Electrolytic, domestic	41.00
Precipitated	40.50 to 45.00
Atomized	39.80 to 48.30
Hydrogen reduced, f.o.b.	43.25
Bronze	47.20 to 51.50
Chromium, electrolytic	$5.00
Lead	19.00
Manganese, f.o.b.	42.00
Molybdenum	$3.60 to $3.95
Nickel	$1.05 to $1.03
Nickel Silver	53.50
Nickel Steel	13.00
Solder	13¢ plus metal value
Stainless Steel, 302	$1.07
Stainless Steel, 316	$1.26
Steel, atomized, prealloyed, 4600 series	14.00 plus metal value
Tin	14¢ plus metal value
Titanium, 99.25+%, per lb., f.o.b.	$11.25
Tungsten	$3.15 (nominal)

* F.O.B., shipping point.

BOLTS, NUTS, RIVETS, SCREWS

(Base discount, f.o.b. mill)

Pct. Discounts

Bolts	1-4 Containers	5 Containers	20,000 Lb.	40,000 Lb.
Machine ½" and smaller x 3" and shorter	55	57	61	62
⅝" diam. x 3" and shorter	47	49½	54	55
¾" thru 1" diam x 6" and shorter	37	39½	45	46
¾" thru 1" diam. longer than 6" and 11½" and larger x all lengths	31	34	40	41
Rolled thread, ½" and smaller x 3" and shorter	55	57	61	62
Carriage, lag, plow, tap, blank, step, elevator and fitting up bolts ½" and smaller x 6" and shorter	48	50½	55	56

Note: Add 25 pct for less than container quantity. Distributor prices are 5 pct less on bolts and square nuts.

Nuts, Hex, HP reg. & hvy.	Full case or Keg price
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½
C. P. Hex, reg. & hvy.	
¾ in. or smaller	62
⅞ in. to 1½ in inclusive	56
1⅝ in. and larger	51½
Hot Galv. Hex Nuts (All Types)	
¾ in. and smaller	41
Semi-finished Hex Nuts	
¾ in. or smaller	62
⅞ in. to 1½ in. inclusive	56
1⅝ in. and larger	51½

(Add 25 pct for broken case or keg quantities)

Finished

⅞ in. and smaller 65

Rivets	*Base per 100 lb*
½ in. and larger	$12.85
	Pct. Off List
7/16 in. and smaller	15

Cap Screws	*Discount (Packages)*
	Full Finished H. C. Heat Treat
New std. hex head, packaged	Full Case
⅝" diam. and smaller x 6" and shorter	54
¾", ⅞", and 1" diam. x 6" and shorter	38
⅝" diam. and smaller x longer than 6"	..
¾", ⅞", and 1" diam. x longer than 6"	..

	C-1018 Steel Full-Finished Cartons	Bulk
¼" through ⅝" dia. x 6" and shorter	59	48
¾" through 1" dia. x 6" and shorter	45	32

Minimum quantity—¼" through ⅜" diam., 15,000 pieces; 7/16" through ⅝" diam., 5,000 pieces; ¾" through 1" diam., 2,000 pieces.

Machine Screws & Stove Bolts

	Discount Mach. Screws	Stove Bolts
Plain Finish Cartons	60	60
Bulk *Quantity*		
To ¼" diam. incl. 25,000-and over	60	..
5/16 to ½" diam. incl. 15,000-200,000	60	..

Machine Screws & Stove Bolt Nuts

	Discount Hex	Square
In Cartons	16	19
Quantity		
In Bulk ⅜" diam. & smaller 25,000-and over	15	16

ELECTROPLATING SUPPLIES

Anodes

(Cents per lb, frt allowed in quantity)

Copper	
Rolled elliptical, 18 in. or longer, 5000 lb lots	44.50
Electrodeposited	37.50
Brass, 80-20, ball anodes, 2000 lb or more	47.50
Zinc, ball anodes, 2000 lb lots	18.00
(for elliptical add 1¢ per lb)	
Nickel, 99 pct plus, rolled carton, 5000 lb	1.0225
(Rolled depolarized add 3¢ per lb)	
Cadmium	1.45
Tin, ball anodes $1.05 per lb (approx.).	

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	65.90
Copper sulphate, 100 lb bags, per cwt.	22.75
Nickel salts, single, 100 lb bags	36.00
Nickel chloride, freight allowed, 100 lb	45.00
Sodium cyanide, domestic, f.o.b. N. Y., 200 lb drums	23.70
(Philadelphia price 24.00)	
Zinc cyanide, 100 lb	60.75
Potassium cyanide, 100 lb drum N. Y.	45.50
Chromic acid, flake type, 10,000 lb or more	30.44

CAST IRON WATER PIPE INDEX

Birmingham	125.8
New York	138.5
Chicago	140.9
San Francisco-L. A.	148.6

Dec. 1955, value, Class B or heavier 5 in. or larger, bell and spigot pipe. Explanation: p. 57, Sept. 1, 1955, issue Source: U. S. Pipe and Foundry Co.

STEEL SERVICE CENTERS

Metropolitan Price, dollars per 100 lb.

Cities	City Delivery‡ Charge	Sheets: Hot-Rolled (18 ga. & hvr.)	Sheets: Cold-Rolled (15 gage)	Sheets: Galvanized (10 gage)††	Strip: Hot-Rolled	Plates	Shapes: Standard Structural	Bars: Hot-Rolled (merchant)	Bars: Cold-Finished	Alloy Bars: Hot-Rolled 4615 As rolled	Alloy Bars: Hot-Rolled 4140 Annealed	Alloy Bars: Cold-Drawn 4615 As rolled	Alloy Bars: Cold-Drawn 4140 Annealed
Atlanta		8.59	9.87	10.13	8.91	9.29	9.40	9.39	13.24*	.....	.....	.....	.....
Baltimore	$.10	8.65	9.35	9.09	9.15	9.10	9.65	9.55	11.80*	16.28	15.28	19.82	19.08
Birmingham		8.18	9.45	10.46	8.51	8.89	9.00	8.99	.....	.....	.....	.....	.....
Boston**	.10	10.22[1]	11.27[2]	12.07[3]	12.17[4]	10.42[5]	10.72[6]	10.34[7]	13.45*	16.79	15.79	20.29	19.54
Buffalo	.15	8.55	9.75	11.00	8.90	9.35	9.40	9.30	11.60*	16.34	15.55	19.01	19.30
Chicago	.15	8.40	9.60	11.05	8.66	9.04	9.15	9.14	9.30	16.20	15.20	19.70	18.95
Cincinnati	.15	8.58	9.66	11.10	8.98	9.42	9.71	9.46	11.68*	16.52	15.52	20.02	19.27
Cleveland	.15	8.51	9.69	11.15	8.78	9.28	9.54	9.25	11.40*	16.31	15.31	19.81	19.06
Denver	.20	9.60	11.84	12.94	9.63	9.96	10.04	10.00	11.19	.....	.....	.....	20.84
Detroit	.15	8.66	9.86	11.40	9.03	9.41	9.71	9.45	9.66	15.46	15.48	18.81	19.23
Houston		8.10	8.60	.....	8.15	8.45	8.05	8.10	11.60	16.20	15.25	19.65	18.95
Kansas City	.15	9.02	10.27	11.37	9.33	9.71	9.82	9.81	10.22	16.87	15.87	20.37	19.62
Los Angeles		8.70[8]	11.20-11.80	12.20	9.15	9.10	9.00	9.10	12.95	17.30	16.35	21.30	20.60
Memphis	.15	8.55	9.80	.....	8.60	8.93	9.01	8.97	12.11*	.....	.....	.....	.....
Milwaukee	.15	8.54	9.74	11.19	8.80	9.18	9.37	9.28	9.54	16.34	15.34	19.84	19.09
New York	.10	9.27	10.59	11.40	9.74	9.87	9.84	10.09	13.35*	16.16	15.60	20.10	19.35
Norfolk	.20	8.20	.....	.....	8.90	8.65	9.20	8.90	10.70	.....	.....	.....	.....
Philadelphia	.10	8.30	9.35	10.71	9.35	9.25	9.20	9.50	12.05*	16.58	15.58	20.08	19.33
Pittsburgh**	.15	8.32[1]	9.61[2]	10.95[3]	10.36[4]	8.52[5]	9.24[6]	8.62[7]	11.40*	16.20	15.20	19.70	18.95
Portland		10.00	11.75	13.30	11.95	11.50	11.10	9.85	15.30*	18.50	17.45	20.75	20.25
San Francisco	.10	9.75	11.20[9]	11.50	9.85	10.10	9.95	10.25	13.70	17.05	16.35	21.05	20.60
Seattle		10.30	11.55	12.50	10.25	10.10	10.20	10.50	14.70	17.15	16.80	20.65	20.60
Spokane	.15	10.45	11.70	10.90	10.65	10.25	10.35	11.15	14.85	17.75	16.95	21.55	20.75
St. Louis	.15	8.78	9.98	11.43	9.04	9.42	9.63	9.52	9.93	16.58	15.58	20.08	19.33
St. Paul	.15	8.94	10.19	11.64	8.99	9.45	9.53	9.70	10.16	.....	15.41	.....	19.21

Base Quantities (Standard unless otherwise keyed): Cold finished bars: 2000 lb or over. Alloy bars: 1000 to 1999 lb. All others: 2000 to 4999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may be combined with each other for quantity. ** Bost. and Pitts. prices based on 2000 lb item quantities except for galv. sheet, c-f and alloy bars.

†† 10¢ zinc. ‡ Deduct for country delivery. * C1018—1 in. rounds. [1] 10 ga. x 36 x 96 —120; [2] 20 ga. x 36 x 96 —120; [3] 10 ga. x 36 —120; [4] ¼" x 1"; [5] ¼" x 84"; [6] I-Beams 6 x 12.5; [7] Rounds—¾-2 15/16"; [8] 15 ga. & heavier; [9] 14 ga. & lighter.

(Effective May 18, 1959)

Pay less for more strength! Tenzaloy the self-aging aluminum alloy needs no heat treatment! If your aluminum castings are too large or too intricate for heat treatment, if your heat treating facilities are limited, if you need superior strength than you get from ordinary heat-treated alloy demand "Federated Tenzaloy" developed by Federated to meet the need for a superior aluminum alloy that ages at room temperature. Tenzaloy eliminates rejects due to warpage, expansion, and internal stresses caused by quenching. Tenzaloy finished properties are stable, proved by conclusive test data over a ten year period. No special foundry techniques are required. No fluxes. Castability is excellent with sand cast and plaster molds and many permanent molds. Tenzaloy will not "grow," produces corrosion-resistant castings with excellent polishing characteristics and anodizes clear white. Write for Tenzaloy Bulletin No. 103. Federated Metals Division, 120 Broadway, New York 5. In Canada: Federated Metals Canada, Ltd., Toronto and Montreal.

FEDERATED METALS DIVISION OF

ASARCO

AMERICAN SMELTING AND REFINING COMPANY

TENZALOY is one of a complete series of Federated aluminum casting alloys. A new plant in Alton, Ill. will soon be in production to satisfy the requirements for Tenzaloy in the mid-west.

58-28

(Ferroalloy prices will next appear in the May 28 issue.)

PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

Producing Point	Basic	Fdry.	Mall.	Bess.	Low Phos.
Birdsboro, Pa. *B6*	68.00	68.50	69.00	69.50	.....
Birmingham *R3*	62.00	62.50*	.....	.....	.....
Birmingham *W9*	62.00	62.50*	66.50	.....	.....
Birmingham *U4*	62.00	62.50*	66.50	.....	.....
Buffalo *R3*	66.00	66.50	67.00	67.50	.....
Buffalo *H1*	66.00	66.50	67.00	67.50	.....
Buffalo *W6*	66.00	66.50	67.00	67.50	.....
Chester *P2*	66.50	67.00	67.50	.....	.....
Chicago *I4*	66.00	66.50	66.50	67.00	.....
Cleveland *A5*	66.00	66.50	66.50	67.00	71.00†
Cleveland *R3*	66.00	66.50	66.50	67.00	.....
Duluth *I4*	66.00	66.50	66.50	67.00	71.00†
Erie *I4*	66.00	66.50	66.50	67.00	71.00†
Everett *M6*	67.50	68.00	68.50	.....	.....
Fontana *K1*	75.00	75.50	.....	.....	.....
Geneva, Utah *C7*	66.00	66.50	.....	.....	.....
Granite City *G2*	67.90	68.40	68.90	.....	.....
Hubbard *Y1*	.....	.....	66.50	.....	.....
Ironton, Utah *C7*	66.00	66.50	.....	.....	.....
Midland *C11*	66.00	.....	.....	.....	.....
Minnequa *C6*	68.00	68.50	69.00	.....	.....
Monessen *P6*	66.00	.....	.....	.....	.....
Neville Is. *P4*	66.00	66.50	66.50	67.00	71.00†
N. Tonawanda *T1*	.....	66.50	67.00	67.50	.....
Sharpsville *S3*	66.00	.....	66.50	67.00	.....
So. Chicago *R3*	66.00	66.50	66.50	67.00	.....
So. Chicago *W8*	66.00	.....	66.50	67.00	.....
Swedeland *A2*	68.00	68.50	69.00	69.50	.....
Toledo *I4*	66.00	66.50	66.50	67.00	.....
Troy, N. Y. *R3*	68.00	68.50	69.00	69.50	73.00
Youngstown *Y1*	.....	.....	66.50	.....	.....

DIFFERENTIALS: Add, 75¢ per ton for each 0.25 pct silicon or portion thereof over base (1.75 to 2.25 pct except low phos., 1.75 to 2.00 pct) 50¢ per ton for each 0.25 pct manganese or portion thereof over 1 pct, $2 per ton for 0.50 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Add $1.00 for 0.31-0.69 pct phos.

Silvery Iron: Buffalo (6 pct), *H1*, $79.25; Jackson *J1*, *I4* (Globe Div.), $78.00; Niagara Falls (15.01-15.50), $101.00; Keokuk (14.01-14.50), $103.50; (15.51-16.00), $106.50. Add $1.00 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 18 pct. Add $1.25 for each 0.50 pct manganese over 1.00 pct. Bessemer silvery pig iron (under .10 pct phos.); $64.00. Add $1.00 premium for all grades silvery to 18 pct.

† Intermediate low phos.

STAINLESS STEEL

Base price cents per lb. f.o.b. mill

Product	201	202	301	302	303	304	316	321	347	403	410	416	430
Ingots, reroll.	22.75	24.75	24.00	26.25	—	28.00	41.25	33.50	38.50	—	17.50	—	17.75
Slabs, billets	28.00	31.50	29.00	32.75	33.25	34.50	51.25	41.50	48.25	—	22.25	—	22.50
Billets, forging	—	37.75	38.75	39.50	42.50	42.00	64.50	48.75	57.75	29.25	29.25	29.75	29.75
Bars, struct.	43.50	44.50	46.00	46.75	49.75	49.50	75.75	57.50	67.25	35.00	35.00	35.50	35.50
Plates	39.25	40.00	41.25	42.25	45.00	45.75	71.75	54.75	64.75	30.00	30.00	31.25-31.75	31.00
Sheets	48.50	49.25	51.25	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	48.25	40.75
Strip, hot-rolled	36.00	39.00	37.25	40.50	—	44.25	69.25	53.50	63.50	—	31.00	—	32.00
Strip, cold-rolled	45.00	49.25	47.50	52.00	56.75	55.00	80.75	65.50	79.25	40.25	40.25	42.50	40.75
Wire CF; Rod HR	—	42.25	43.50	44.25	47.25	47.00	71.75	54.50	63.75	33.25	33.25	33.75	33.75

STAINLESS STEEL PRODUCING POINTS:

Sheets: Midland, Pa., *C11;* Brackenridge, Pa., *A3;* Butler, Pa., *A7;* Vandergrift, Pa., *U1;* Washington, Pa., *W2, J2;* Baltimore, *E1;* Middletown, O., *A7;* Massillon, O., *R3;* Gary, *U1;* Bridgeville, Pa., *U2;* New Castle, Ind., *I2;* Detroit, *M2;* Louisville, O., *R5.*

Strip: Midland, Pa., *C11;* Waukegan, Cleveland, *A5;* Carnegie, Pa., *S9;* McKeesport, Pa., *F1;* Reading, Pa., *C2;* Washington, Pa., *W2;* W. Leechburg, Pa., *A3;* Bridgeville, Pa., *U2;* Detroit, *M2;* Detroit, *S1;* Canton, Massillon, O., *R3;* Harrison, N. J., *D3;* Youngstown, *R5;* Sharon, Pa., *S1;* Butler, Pa., *A7;* Wallingford, Conn., *U3* (plus further conversion extras); *W1* (25¢ per lb. higher); Seymour, Conn., *S13,* (25¢ per lb. higher); New Bedford, Mass., *R6;* Gary, *U1,* (25¢ per lb. higher).

Bar: Baltimore, *A7;* S. Duquesne, Pa., *U1;* Munhall, Pa., *U1;* Reading, Pa., *C2;* Titusville, Pa., *U2;* Washington, Pa., *J2;* McKeesport, Pa., *U1, F1;* Bridgeville, Pa., *U2;* Dunkirk, N. Y., *A3;* Massillon, O., *R5;* S. Chicago, *U1;* Syracuse, N. Y., *C11;* Watervliet, N. Y., *A3;* Waukegan. *A5;* Canton, O., *T5, R3;* Ft. Wayne, *I4;* Detroit, *R5;* Gary, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8;* Ambridge, Pa., *B7.*

Wire: Waukegan, *A5;* Massillon, O., *R3;* McKeesport, Pa., *F1;* Ft. Wayne, *J4;* Newark, N. J. *D2;* Harrison, N. J., *D3;* Baltimore, *A7;* Dunkirk, *A3;* Monessen, *P1;* Syracuse, *C11;* Bridgeville, *U2;* Detroit, *R5.*

Structurals: Baltimore, *A7;* Massillon, O., *R3;* Chicago, Ill., *J4;* Watervliet, N. Y., *A3;* Syracuse, *C11;* S. Chicago, *U1.*

Plates: Ambridge, Pa., *B7;* Baltimore, *E1;* Brackenridge, Pa., *A3;* Chicago, *U1;* Munhall, Pa., *U1;* Midland, Pa., *C11;* New Castle, Ind., *I2;* Middletown, *A7;* Washington, Pa., *J2;* Cleveland, Massillon, *R3;* Coatesville, Pa., *C15;* Vandergrift, Pa., *U1;* Gary, *U1.*

Forging billets: Ambridge, Pa., *B7;* Midland, Pa., *C11;* Baltimore, *A7;* Washington, Pa., *J2;* McKeesport, *F1;* Massillon, Canton, O., *R3;* Watervliet, *A3;* Pittsburgh, Chicago, *U1;* Syracuse, *C11,* Detroit, *R5;* Munhall, Pa., S. Chicago, *U1;* Owensboro, Ky., *G5;* Bridgeport, Conn., *N8.*

(Effective May 18, 1959)

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For as long as many can remember, the trademark Mixmaster has been the symbol of a quality, dependable household mixer. The pioneer producer of this type of popular kitchen appliance, Sunbeam has always insisted on the best materials and meticulous workmanship.

No little attention is given to attaining the highest quality chrome plating on the beater shafts, for example. The chrome must be smooth, free of pits where food might accumulate, and remain bright over years of hard use. To accomplish this, burnishing the cold finished steel bars formerly used for one hour was necessary in order to bring the bars up to the pre-plating brightness and smoothness required.

This expensive, time-consuming operation has been reduced to only a few minutes since Bliss & Laughlin's Lusterized cold finished steel bars have been used. That's because dulling, gritty processing contaminants, oils and lime are removed at the mill by Bliss & Laughlin's exclusive, patented finishing process. The close tolerances characteristic of Bliss & Laughlin production enable Sunbeam to count on a consistently tight fit of the shafts at the beater bearings, which minimizes vibration.

Ask us to show you how your production can benefit from the tangible quality and cost-saving advantages of specifying "Bliss & Laughlin Lusterized Finish"—the big difference in cold finished steel bars. Standard prices apply!

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30-Ton; Complete with Generator. New 1948
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REBUILT — GUARANTEED ELECTRICAL EQUIPMENT
MOTOR GENERATOR SETS

Qu.	K.W.	Make	R.P.M.	Volts D.C.	Volts A.C.
3*	3500	Al.Ch.	514	350/700	13,800/6900 4160
1	2000	G.E.	450	132/265	4160/2400
2*	2000	Whse.	720	600	13,800/6900 4160
2	1250	Whse.	720	600	4160/2400
1	1250	G.E.	450	250	4160/2400
2	1000	Whse.	720	600	4160/2400
2	500	Whse.	1200	125/250	4000/2300
1	450	Whse.	900	280/300	2300
3	300	Whse.	1200	125/250	4000/2300
1*	300	Al.Ch.	1200	250/300	2300
3	200	Whse.	1200	125/250	2300
1	150	Whse.	1200	250	2300
1	150	G.E.	1200	250	4600/2300
2	150	Rel.	1200	125	2300

*—3 Unit Sets

SPECIAL, before removal (1) 1875-K.W. Whse., M.G. Set Gen. 250-V.D.C., 514 R.P.M. with 2700-H. P. Syn Motor, 13800/6900/4000-V., 3 ph., 60 cy. with Control.

DIRECT CURRENT MOTORS

Qu.	H.P.	Make	Type	Volts	R.P.M.
1**	3000	G.E.	M.P.C.	300/600	250/360
3***	3000	Whse.	Rev.	525/600	600
1**	2200	Whse.	Mill	600	92/132
8**	1500	Whse.	Rev.	525	600
1**	1250	Al.Ch.	Mill	600	300/600
2**	940	S.S.	Mill	600	800/1000
1**	700	Whse	Mill	600	143
4**	700	Whse.	Rev.	250	300/700
2**	645	S.S.	Mill	300	1000
1	600	Whse.	Mill	250	110/220
2	600	Al.Ch.	Mill	600	300/600
1	400	G.E.	M.P.C.	270	450
1	300	Whse.	Mill	230	300
2	275	Whse.	Q.M.660.6	250	425/850
1	175	G.E.	C.D.175-A	245	800/1025
1	125	Whse.	SK-184	230	575/850
1	125	Whse.	SK-190	230	450/1000
1	100	Rel.	461-T	250	1150/1500
1	100	Whse.	SK-183	230	450/1000
1	100	G.E.	CD-175	230	400/1200
1	80	Rel.	651-T	230	575/1150
1	80	El.Dy.	25-S	230	525/1050
1	50/60	Whse.	SK-131	230	500/1500
1*	50	G.E.	CD-175	230	400/1200
2*	30/40	Whse.	SK-131	230	500/1500

*—T.E.F.C. **—Enclosed Forced Ventilated
***—Two Motors in Tandem.

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Strike Threat Slows Pittsburgh Sales

Used tool dealers say mills hold off on replacing machinery until labor situation clears.

However, even a strike would not bring a complete halt to equipment buying.

▪ The threat of a steel strike clouds the picture for Pittsburgh used machinery dealers.

The average dealer there depends on steel mills for 80 pct of his business. At the moment the mills are holding back, waiting to see what will happen this summer.

Braking Effect—A steel strike would not bring a complete cutoff in buying. During past stoppages purchasing departments continued to place orders. But a shutdown of any kind would depress business. And a long strike would eventually bring things to a full stop.

Reflecting the uncertainty, a supplier of mill machinery reports domestic inquiries have fallen off over the past month. The lag interrupts a pickup that began last August and had boosted shipments well above the level of early 1958.

Overseas Interest—The mills had to put in equipment to meet the order surge they are now experiencing. But now, with the contract expiration date little more than a month away, they are marking time.

Foreign inquiries for mill machinery have held up well. A dealer points out, however, that a domestic shutdown would affect all business because it would not be possible to move equipment out of American mills.

A slightly different reaction has been felt by a supplier of electrical equipment. Demand for motors, motor generators, controls, and other electrical items ran very strong during the early part of the steel recovery.

About two months ago there was an abrupt and sharp slowdown in orders. In the last few weeks, both sales and inquiries have again picked up.

Results of Wear—However, the revival does not indicate any new willingness by steel mills to spend money. Most of the current orders result from breakdown jobs. The heavy load thrown on mills in the second quarter has forced replacements.

For cranes, conveyors, and other materials handling items, the recovery is still largely a matter of inquiries. Dealers are doing a lot of figuring but sales still lag. The same uncertainty that affects other lines makes an early pickup doubtful.

Permanent or Not — However, one dealer felt a strike could work to the advantage of materials handling equipment. "During a strike engineers and purchasing men have time to take stock and line up requirements. In the 1956 shutdown, orders were placed."

Machine tools continue in a pickup that began the first of the year. Dealers are trying to figure out whether this is a permanent recovery or one that will end with the steel strike. While machine tools have less direct dependence on basic steel than more specialized lines, they still follow the steel pattern.

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1	125	G.E. unused	MT-557	220/440	1200
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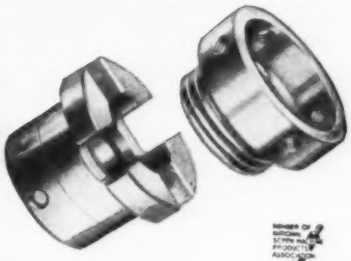
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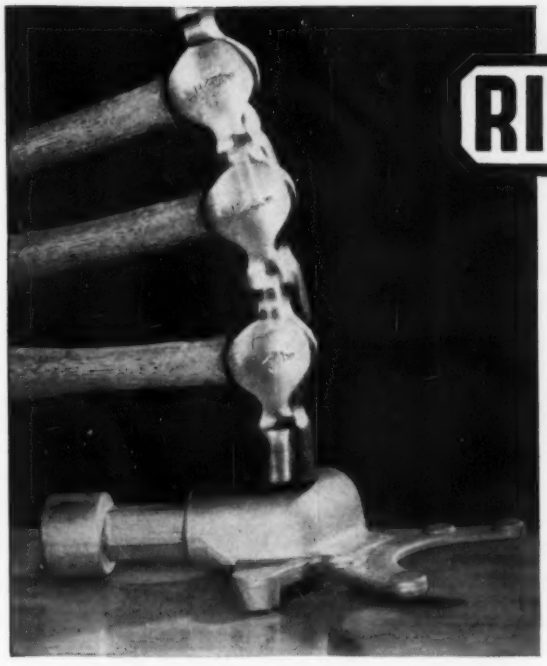

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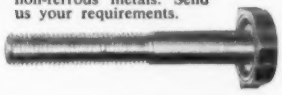

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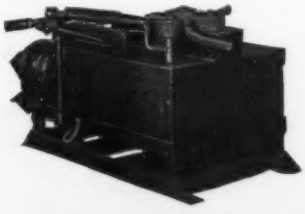

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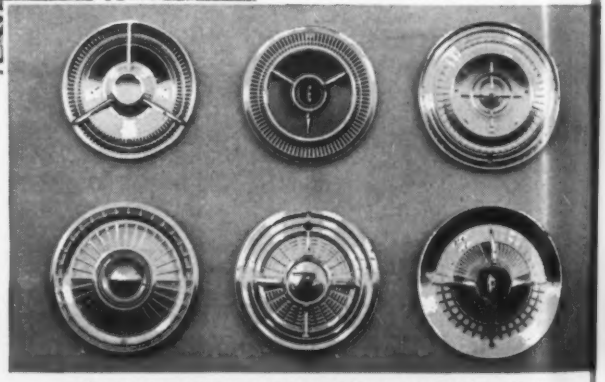

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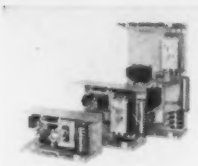

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